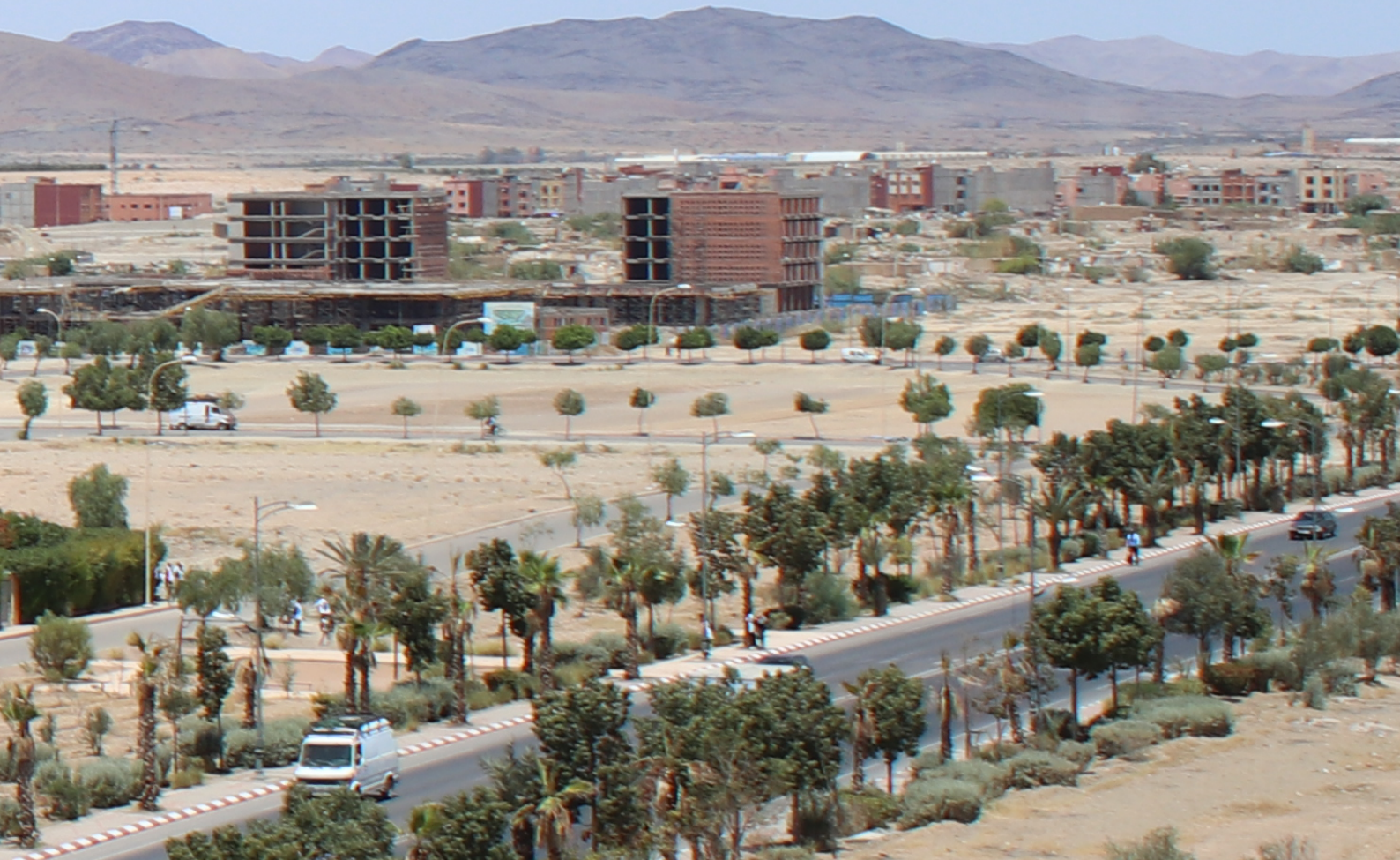
SPECIES CATALOGUE

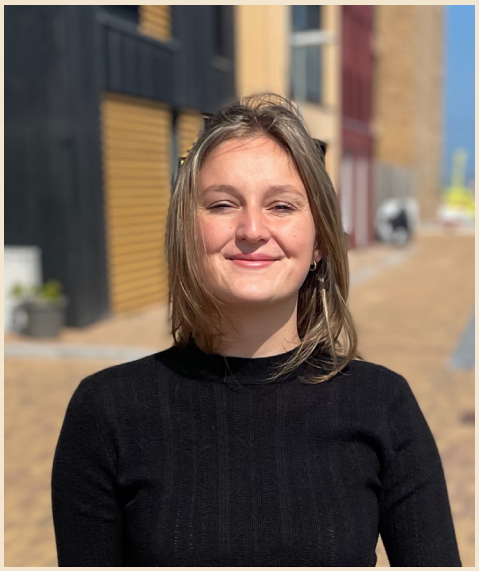
Urban Arid Green - A sustainable approach to address population growth and urbanisation in arid areas, via a case study to Tamansourt

Rosa de Wolf, January 2023



COLOPHON

Urban Arid Green
A sustainable approach to address population growth and urbanisation in arid areas, via a case study to Tamansourt



Cover image: View on Tamansourt, photograph taken from roof of social housing complex, by author (May 2022).

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URBAN ECOLOGY

As the common languages in Tamansourt are Arabic and French, some literature and interviews are translated by the author into English as accurately as possible. Any misinterpretation falls on the author.

CONTENT

INTRODUCTION CATALOGUE

In this catalogue, the choice of species within the Urban Arid Green project is explained. The Al Omrane palette, recommendations by IUCN, recommendations by Abdelaziz, Driss, Hassane, Rania & Mohammed (2022), and the observed species during the site visits form a catalogue of 144 different species, which is shown on the next pages. This catalogue includes trees and palms, shrubs and ground cover. Al Omrane has an extra category; perennials and flowering plants. These types are highlighted in the tables via the legend below. However, some smaller trees can be cultivated as shrubs and vice versa.

trees and palms

shrubs

cover

perennials and flowering plants

For the transition of Tamansourt into an ecocity, vegetation plays a big role, as mentioned in the spatial analysis. The Urban Arid Green project aims to form a base of native species only. This is because, as explained by Roeland Lelieveld, native species contribute most to the local biodiversity. Naturalized, introduced and alien species can be added to this base, as long as they don't harm the native species.

As explained in the analysis, in the urban area, temperatures are rising due to the urban heat island effect and climate change. Furthermore, due to facilities and accessibility, it is easier to maintain vegetation in this area. Alien species might need extra care.

Ground-bounded vegetation should be prioritised when possible as this adds more to the biodiversity and soil quality. On balconies, vegetation can be planted in pots. Only in pots in the urban area, native and alien species that are invasive could be planted, although this is a risk when the seeds disperse.

Alien invasive species require too much maintenance and do not contribute as much to biodiversity. It seems tempting to add these species as they can start the revegetation process easier. However, there is no place for these species in the long-term vision of Tamansourt Ecocity 2040.

Based on the aims and conditions shown in the table below, a list of preferred species per landscape/site will be formulated.

Landscape	Conditions	Aims	Species
Urban area ▪ groundbounded ▪ balconies ▪ roofs/walls	▪ Easier maintenance ▪ Hotter temperatures, urban heat island effect	▪ Ornamental ▪ Experience ▪ Comfordability	▪ Prefer native ▪ Introduced ▪ Naturalized ▪ Invasive in pots ▪ Groundbounded prioritised
Central hub, along facilities	▪ Easier maintenance	▪ Research ▪ Experience ▪ Comfordability	▪ Native and exotic ▪ Sum of all species
Central hub, agroforestry	▪ Easier maintenance	▪ Improve soil condition ▪ Afforestation ▪ Economic value	▪ Native ▪ No invasive species ▪ Trees or types with economic value
Seasonal parks	▪ Very little maintenance ▪ Droughts ▪ Occasionaly wet	▪ Retain water ▪ Revegetation ▪ Improve soil condition ▪ Erosion control	▪ Native only ▪ Easy disperse, not invasive

Aims and conditions per landscape.

LEGEND

To determine which species can grow in which location, all species must be assessed. This is done based on the following characteristics:
Nativeness, drought tolerance, edibility, economic value, water demand, invasiveness.

Some characteristics can express in gradients as shown in the legend below.

Scientific name

Nativeness	*Native*	*Naturalised*	*Introduced*	*Alien or unkown*
Drought tolerance	*Good drought-tolerant*	*Semi drought-tolerant*	*Intolerant to drought or unknown*	
Edibility	*Edible*	*Inedible or unknown*		
Economic value	*Good economic value*	*Little economic value*	*No economic value or unknown*	
Water demanding	*Not water demanding*	*Semi demanding*	*Demanding or unknown*	
Invasiveness	*Not invasive*	*Invasive or unknown*		

Explanation legend.

This legend helps to determine per specie if and on what site it could be planted in Tamansourt, following the matrix below.

Suitability

Species suitable for all landscapes.

Species suitable for agroforestry, less interesting for seasonal parks.

Species suitable for seasonal parks, less interesting for agroforestry.

Species suitable for urban area, not suitable for parks and agroforestry.

With good reasoning, only suitable for controlled experiments or in pots. - further research needed.

Explanation suitability species.

SPECIES

Scientific name	Suitability
1. Quercus ilex	
2. Quercus coccifera	
3. Quercus faginea	
4. Quercus canariensis	
5. Quercus rotundifolia	
6. Quercus suber	
7. Olea europea sylvestris	
8. Olea europaea maroccana	
9. Pinus halepensis	
10. Pinus pinea	
11. Pinus pinaster	
12. Tetraclinis articulata	
13. Argania spinosa	
14. Vachellia gummifera	
15. Ziziphus lotus	
16. Pistacia atlantica	
17. Pistacia lentiscus	
18. Periploca laevigata	
19. Maytenus senegalensis	
20. Ruscus hypophyllus	
21. Arbutus unedo	
22. Teucrium fruticans	
23. Juniperus phoeniceae	
24. Rhamnus cathartica	
25. Rhamnus alaternus	
26. Ceratonia silicua	
27. Chamaerops humilis	
28. Rosmarinus officinalis	
29. Myrtus communis	
30. Phillyrea angustifolia	
31. Cupressus atlantica	

The vegetation species recommended by IUCN.

Scientific name	Suitability
1. Olea europea	
2. Ziziphus jujube	
3. Eucalyptus camaldulensis	
4. Washingtonia robusta	
5. Populus fremontii	
6. Jacaranda mimosifolia	
7. Cupressus sempervirens	
8. Tecoma stans	
9. Ficus microcarpa	
10. Argania spinosa	
11. Citrus aurantium	
12. Euonymus japonicus	
13. Nicotiana glauca	
14. Cenchrus setaceus	
15. Scolymus hispanicus	
16. Suaede vera	
17. Lagerstroemia indica	
18. Leptospermum scoparium	
19. Callistemon citrinus	
20. Duranta erecta	
21. Nerium oleander	
22. Cylindropuntia imbricata	
23. Atriplex cansescens	
24. Agave americana 'Variegata'	
25. Plumbago auriculate	
26. Agave americana	
27. Agave sisalana	
28. Agave shawii	
29. Parkinsonia aculeata	
30. Cousinia thomsonii	
31. Tradescantia pallida	
32. Solanum elaeagnifolium	
33. Chorizanthe rigida	
34. Hololachane soongarica	
35. Carpobrotus chilensis	

The vegetation species observed in Tamansourt.

Scientific name	Suitability
1. Washingtonia robusta	
2. Phoenix dactylifera	
3. Phoenix canariensis	
4. Phoenix roebelenii	
5. Chamaerops humilis	
6. Bismarckia nobilis	
7. Butia capitata	
8. Araucaria eexcelsa	
9. Cupressus sempervirens	
10. Ficus retusa	
11. Spathodea campanulata	
12. Jacaranda mimosifolia	
13. Melia azedarach	
14. Erythrina caffra	
15. Sophora japonica	
16. Lagunaria patersonia	
17. Schinus terebinthifolius	
18. Schinus molle	
19. Branchychiton populneus	
20. Citrus aurantium	
21. Ficus benjamin	
22. Callistemon viminalis	
23. Ligustrum japonicum	
24. Bauhinia variegata	
25. Plumbago capensis	
26. Polygala myrtifolia	
27. Acokanthera sp.	
28. Nerium oleaner	
29. Bougainvillea glabra	
30. Myrtus communis	
31. Dracaena draco	
32. Westringia fruticosa	
33. Pittosporum tobira	
34. Duranta repens	
35. Carissa grandiflora	
36. Jasmins (officinale, sambac,...)	
37. Bougainvillier Janah	

38. Cotinus coggygria	
39. Phormium tenax	
40. Cordyline australis	
41. Solanum rantonnetii	
42. Thuya occidentalis	
43. Lavandula (multifida)	
44. Festuca glauca	
45. Acorus gramineus	
46. Gaura lindheimeri	
47. Rosa (canina)	
48. Euryops (chrysanthemoides)	
49. Gazania sp.	
50. Impatiens nouvelle Guinée	
51. Dimorphotheca	
52. Pervenche	
53. Pennisetum setaceum	
54. Stipa tenuifolia	
55. Cuphea sp.	
56. Nerium oleaner	
57. Tulbaghia violacea	
58. Arctotis sp.	
59. Géranium Lierre (pelargonium)	
60. Chrysanthemum	
61. Pétunia	
62. Verbena officinalis	
63. Gnaphalium lanatum	
64. Rosmarinus prostratus	
65. Vinca major variegata	
66. Pennisetum clandestinum	
67. Hedera helix	
68. Vinca major	
69. Dorotheanthus bellidiformis	
70. Paspalum sp.	

The vegetation palette for Tamansourt by Al Omrane.

Scientific name	Suitability
1. Whashingtonia robusta	
2. Brachychiton populneus	
3. Olea europea	
4. Acacia saligna	
5. Retama raetam	
6. Pistacia lentiscus L.	
7. Yucca (Superba, Variegata, Nobilis, Mediostriata)	
8. Cacti	

The vegetation species recommended by (Abdelaziz, Driss, Hassane, Rania & Mohammed, 2022).

CONCLUSION

The tables below show the sets of species that can be grown in Tamansourt per location. More species can be added to these lists as long they meet the formulated requirements.

Urban Area

Scientific name	Origin
Washingtonia robusta	naturalized
Chamaerops humilis	not native
Cupressus sempervirens	not fully native
Jacaranda mimosifolia	naturalized
Melia azedarach	naturalized
Schinus molle	naturalized
Gazania sp.	naturalized
Agave americana 'Variegata'	naturalized
Plumbago auriculate	introduced
Washingtonia robusta	naturalized
Jacaranda mimosifolia	introduced
Cenchrus setaceus	native

Proposed vegetation palette to grow in the urban area

Central Hub - Agroforest

Scientific name	Origin
Quercus ilex	native
Quercus coccifera	native
Quercus faginea	native
Quercus rotundifolia	native
Quercus suber	native
Olea europea sylvestris	native
Olea europaea maroccana	native
Pinus halepensis	native
Pinus pinea	native
Pinus pinaster	native
Tetraclinis articulata	native
Argania spinosa	native
Ziziphus lotus	native
Pistacia atlantica	native
Pistacia lentiscus	native
Ceratonia silicua	native
Phillyrea angustifolia	native
Cupressus atlantica	native
Olea europea	native
Ziziphus jujube	naturalized
Eucalyptus camaldulensis	introduced
Argania spinosa	native
Citrus aurantium	native
Phoenix dactylifera	native
Verbena officinalis	native
Lavandula (multifida)	native
Nerium oleaner	native

Proposed vegetation palette to grow in the agroforest.

Seasonal Parks

Scientific name	Origin
Quercus ilex	native
Quercus faginea	native
Quercus suber	native
Olea europaea maroccana	native
Pinus halepensis	native
Pinus pinea	native
Pinus pinaster	native
Tetraclinis articulata	native
Argania spinosa	native
Ziziphus lotus	native
Pistacia atlantica	native
Pistacia lentiscus	native
Arbutus unedo	native
Teucrium fruticans	native
Chamaerops humilis	native
Rosmarinus officinalis	native
Myrtus communis	native
Phillyrea angustifolia	native
Olea europea	native
Argania spinosa	native
Citrus aurantium	native
Nerium oleaner	native
Phoenix dactylifera	native
Citrus aurantium	native
Myrtus communis	native
Dracaena draco	native
Lavandula (multifida)	native
Rosa (canina)	native
Pennisetum setaceum	native
Nerium oleaner	native
Hedera helix	native

Proposed vegetation to grow in the Seasonal Parks.

EXTRA INFO

Scientific name	Origin	Facts	Suitability	Source
1. Quercus ilex	native	grows fast is moist, well-drained soil. Tolerates drought.	Park, agroforestry	https://www.gardenia.net/plant/quercus-ilex
2. Quercus coccifera	native	low maintenance, showy fruit. Rich, moist, well-drained soil.	Agroforestry	https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280738
3. Quercus faginea	native	Withstands frosts and a certain degree of drought	Park, agroforestry	https://www.arbolapp.es/en/species/info/quercus-faginea/
4. Quercus canariensis	native	Occur in cool, protected spots like banks of streams.	-	https://www.arbolapp.es/en/species/info/quercus-canariensis/
5. Quercus rotundifolia	native	The acorns povide a source of food for birds and mammals, little maintenance, prefers moist, fertile, well-drained soil.	Agroforestry	https://davisla.wordpress.com/2015/02/18/quercus-rotundifolia/
6. Quercus suber	native	cork harvest, regenerates its bark, grows easily is acid, dry to medium, well-drained soils.	Agroforestry, park	https://www.gardenia.net/plant/quercus-suber
7. Olea europea sylvestris	native	a wild olive tree with a bushy style. Smaller leaves and fruits than in cultivated olive trees, rough look of its bark accentuates its old age appearance. Low and controlled irrigation.	Agroforestry	https://www.mistralbonsai.com/en/all-about-bonsai/bonsai-datasheets/mediterranean-bonsai/olea-europaea-sylvestris/
8. Olea europaea maroccana	native		Agroforestry, park	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:1019529-1
9. Pinus halepensis	native	Agroforestry, erosion control, revegetation, soil improvement, ornamental	Park, urban, agroforestry	https://www.cabi.org/isc/datasheet/41617
10. Pinus pinea	native	editable oily seeds, drought and salt resistent.	agroforestry, park	https://www.gardenia.net/plant/pinus-pinea
11. Pinus pinaster	native	erosion control, landscape improvement, revegetation, soil conservation	park, agroforestry	https://www.cabi.org/isc/datasheet/41688
12. Tetraclinis articulata	native	ornamental, pharmaceutical, oils. Very drought tolerant, excellent tree for afforesting rocky slopes in semi-arid areas.	agroforestry, park, urban	http://temperate.theferns.info/plant/Tetraclinis+articulata
13. Argania spinosa	native	resistant to extreme heat and drought, food, oil, honey, medicine, erosion control.	agroforestry, park	http://apps.worldagroforestry.org/treedb/AFTPDFS/Argania-spinosa.PDF
14. Vachellia gummifera	native		-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77131720-1
15. Ziziphus lotus	native	edible fruit, agroforestry, pharmaceutical, plays a major role in fixing soil in arid and semi arid regions where soil erosion is a major issue, attractive to bees.	agroforestry, park	http://temperate.theferns.info/plant/Ziziphus+lotus
16. Pistacia atlantica	native	edible resin and oils from fruit, perfumes and manufactoring alcohol, ornamental. Used for reforestation and to prevent soil erosion on steep slopes. Tolerates drought, well-drained light soil.	agroforestry, park, urban	https://www.euforgen.org/species/pistacia-atlantica/
17. Pistacia lentiscus	native	easily grown in dry, poor, soil. Inedible fruits. Mastix, aromatic sap used for edible purposes.	park, agroforestry	https://www.gardenia.net/plant/pistacia-lentiscus
18. Periploca laevigata	alien	full sun, grows in fertile, well-drained soils, does not tolerate frost.	-	https://www.jardineriaon.com/en/periploca-laevigata.html

The vegetation species recommended by IUCN.

19. Maytenus senegalensis	native			https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:161441-1
20. Ruscus hypophyllus	native			https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:540453-1
21. Arbutus unedo	native	full sun to part shade, dry to medium watering, low maintenance. tolerates droughts.	Park	https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=279932
22. Teucrium fruticans	native	thrives in heat and poor rocky soils. Lavender-blue flowers (in palette by Al Omrane). Neutral to alkaline soil. Drought-tolerant.	Park, urban	https://www.gardenia.net/plant/teucrium-fruticans
23. Juniperus phoeniceae	alien		-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:262307-1
24. Rhamnus cathartica	native	ornamental. dye. Leaf litter decomposition occurred more rapidly via the high nitrogen content of the litter. Rapid litter decomposition may increase soil fertility and favour the growth of R. cathartica, although ultimately, it may limit soil fauna diversity.	-	https://www.cabi.org/isc/datasheet/46996
25. Rhamnus alaternus	native			https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:718169-1
26. Ceratonia silicua	native	chemical products, food and drink, pharmaceutical, wood	agroforestry	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:485647-1
27. Chamaerops humilis	native	tolerates poor soil, drought, cold, heat.	park,	https://www.gardenia.net/plant/chamaerops-humilis
28. Rosmarinus officinalis	native	herb, fragrant, drought-tolerant, easily grown in sandy, poor to moderately fertile soil, slightly acidic.	park	https://www.gardenia.net/plant/rosmarinus-officinalis-rosemary
29. Myrtus communis	native	moist, well-drained soil, drought-tolerant	park	https://www.gardenia.net/plant/myrtus-communis-common-myrtle
30. Phillyrea angustifolia	native	withstands high temperatures and droughts, but not cold temperatures. Indifferent to soil type, small fleshy fruits.	park, agroforestry	https://www.arbolappcanarias.es/en/species/info/phillyrea-angustifolia/
31. Cupressus atlantica	native	full sun, moist and well-drained soil.	agroforestry	https://davisla.wordpress.com/2015/03/24/cupressus-atlantica/

Scientific name	Origin	Facts	Suitability	Source
1. Olea europea	native	Olives	Agroforestry, park	https://www.cabi.org/isc/datasheet/37336
2. Ziziphus jujube	naturalized	fruit, agroforestry	Agroforestry	https://www.newworldencyclopedia.org/entry/Jujube
3. Eucalyptus camaldulensis	introduced	highly adaptable tree with ability to tolerate extreme conditions such as drought and soil salinity. Agroforestry, ornamental, honey/honey flora, essential oils, wood, pharmaceutical	Agroforestry	https://www.cabi.org/isc/datasheet/22596
4. Washingtonia robusta	naturalized	ornamantal	Urban	https://www.cabi.org/isc/datasheet/56708
5. Populus fremontii	alien	wood, grows very big very fast, large root system - damage construction	-	https://www.newworldencyclopedia.org/entry/Populus
6. Jacaranda mimosifolia	Introduced	fast growing, deep-rooted and competitive, few plants or crops can grow beneath it	Urban in pots	https://www.cabi.org/isc/datasheet/29212
7. Cupressus sempervirens	not fully native	moist, well-drained soil, drought-tolerant, low maintenance,		https://www.gardenia.net/plant/cupressus-sempervirens
8. Tecoma stans	alien	aggressive plant invader that outcompetes natural vegetation and grassland. Grows along dry riverbeds, often in rocky terrain	-	https://www.cabi.org/isc/datasheet/52951
9. Ficus microcarpa	alien	ornamental, outcompetes native flora by strangling its host plant	-	https://www.cabi.org/isc/datasheet/24130
10. Argania spinosa	native	resistant to extreme heat and drought, food, oil, honey, medicine, erosion control,	park, agroforestry	http://apps.worldagroforestry.org/treedb/AFTPDFS/Argania_spinosa.PDF
11. Citrus aurantium	native	ornamental, food, oils	Agroforestry, urban, park	https://www.cabi.org/isc/datasheet/13440
12. Euonymus japonicus	alien	cultivation, ornamental	-	https://www.cabi.org/isc/datasheet/23206
13. Nicotiana glauca	naturalized	poisonous, ornamental, soil improvement, biofuel, pesticide, pharmaceutical, high seed production, ability to endure drought and flooding, pioneer plant, ability to self-fertilise		https://www.cabi.org/isc/datasheet/36324
14. Cenchrus setaceus	native	ornamental	Urban	https://www.invasiveplantatlas.org/subject.html?sub=6165
15. Scolymus hispanicus	alien	food	-	https://spain.inaturalist.org/taxa/79009-Scolymus-hispanicus
16. Suaede vera	native			https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:167588-1
17. Lagerstroemia indica	alien	cultivated as an ornamental tree, erosion control, resistant to drought, fire, and cold conditions, colonize new habitats, displacing and smothering native vegetation	-	https://www.cabi.org/isc/datasheet/29669
18. Leptospermum scoparium	alien	wind-dispersed, ornamental, identified as a high risk weed, soil stabiliser, honey, landscape improvement, revegetation, soil conservation, erosion control, fuel wood, botanical garden,	-	https://www.cabi.org/isc/datasheet/30097
19. Callistemon citrinus	alien	Drought resistent but prefers regular irrigation.	-	https://www.gardenia.net/plant/callistemon-citrinus
20. Duranta erecta	alien	landscape improvement, windbreak, ornamental	-	https://www.cabi.org/isc/datasheet/20192

The vegetation species observed in Tamansourt.

21. Nerium oleander	native	extensive root system and is used to stabilize the soil in warmer areas, agroforestry, boundary, barrier or support, erosion control, landscape improvement, soil conservation, botanical garden, pesticide, poisonous to mammals	Agroforestry, linear park, urban	https://www.cabi.org/isc/datasheet/36220
22. Cylindropuntia imbricata	alien	very spiny , hedge/barrier and ornament.	consider for controlled grazing	https://www.cabi.org/isc/datasheet/115972
23. Atriplex cansescens	not native	low moist, tolerates a wide variety of soil types, including salt, sand, clay, and very alkaline soils. Tolerates saline soil	-	https://calscape.org/Atriplex-canescens-(Shadscale)
24. Agave americana 'Variegata'	naturalized	Agroforestry, erosion control, landscape improvement, soil conservation, botanical garden, beverage base, honey/honey flora, fibre, poisonous to mammals, pharmaceutical, ornamental	urban	https://www.cabi.org/isc/datasheet/3851
25. Plumbago auriculate	introduced	Botanical garden, pharmaceutical, ornamental. Resillient plant, prefers fertile, well-drained, slightly acidic, sandy soils in sunny localities.	Urban	https://www.cabi.org/isc/datasheet/41933
26. Agave americana	naturalized	agroforestry, erosion control, landscape improvement, soil conservation, botanical garden, honey, fibres, poisonous to mammals, ornamental		https://www.cabi.org/isc/datasheet/3851
27. Agave sisalana	alien	agroforestry, biofuels, botanical garden, vegetable, beverage base, pesticide, pharmaceutical, cosmetics, rapid propagation enables it to out-compete many native outcrop species	-	https://www.cabi.org/isc/datasheet/3855
28. Agave shawii	alien	dry soil and drought tolerant, sandy to gravelly, dry to medium moisture.	-	https://www.gardenia.net/plant/agave-shawii-shaw-agave
29. Parkinsonia aculeata	naturalized	agroforestry, erosion control, revegetation, soil improvement, fiber, wood, charcoal, fuelwood, honey, pharmaceutical, thorns; barrier	-	https://www.cabi.org/isc/datasheet/38519
30. Cousinia thomsonii		rare, high altitude herbacious		
31. Tradescantia pallida	alien	botanical garden, ornamental, ground cover, the juice of leaves and stems may cause irritation and skin allergies, can out-compete native plants	-	https://www.cabi.org/isc/datasheet/117574
32. Solanum elaeagnifolium	naturalized	invade ecosystems and out-compete native flora, poisonous to mammals, pharmaceutical	-	https://www.cabi.org/isc/datasheet/50516
33. Chorizanthe rigida	alien	a common desert plant.	-	https://spain.inaturalist.org/taxa/76317-Chorizanthe-rigida
34. Hololachane soongarica	alien		-	https://www.picturethisai.com/wiki/Hololachne-soongarica.html
35. Carpobrotus chilensis	alien	erosion control, fruit, vegetable, ornamental, ground cover and as a trailing plant on stone walls, increase organic matter over time	-	https://www.cabi.org/isc/datasheet/113009

Scientific name	Origin	Facts	Suitability	Source
1. Washingtonia robusta	naturalized	agroforestry	Urban	https://www.cabi.org/isc/datasheet/56708
2. Phoenix dactylifera	native	edible very sweet fruits, source for alcohol, vinegar, syrup. At least one male plant per 6 female plants.	Agroforestry, park, urban	https://www.gardenia.net/plant/phoenix-dactylifera
3. Phoenix canariensis	alien	Ornamental, honey, successfully grown in urban areas where air pollution, poor drainage, compacted soil, and/or drought are common, very sharp spines	-	https://www.cabi.org/isc/datasheet/40697
4. Phoenix roebelenii	alien	environmental, food, ornamental	-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:668945-1
5. Chamaerops humilis	alien	most adaptable species, tolerating extreme heat and extreme cold. Rich, moist and well-drained soil.	Urban	https://www.gardenia.net/plant/chamaerops-humilis
6. Bismarckia nobilis	alien	highly drought tolerant, not resistant to windstorm damage.	-	https://www.gardenia.net/plant/bismarckia-nobilis
7. Butia capitata	alien	reproduction from seeds is difficult, fruits, oil, seeds	-	https://www.cabi.org/isc/datasheet/10462
8. Araucaria eexcelsa	alien	open, full sun locations, in any well-drained soil type. Surface roots. Potential risks of large falling trunks.	-	https://plants.ces.ncsu.edu/plants/araucaria-heterophylla/
9. Cupressus sempervirens	not fully native	moist, well-drained soil, drought-tolerant, low maintenance,	Urban	https://www.gardenia.net/plant/cupressus-sempervirens
10. Ficus retusa	alien	dispersed by vertebrate frugivores	-	https://www.cabi.org/isc/datasheet/24163
11. Spathodea campanulata	alien	Agroforestry, revegetation, spreads rapidly, grows well in areas with an even distribution of rainfall, tolerates a dry season of up to six months.	-	https://www.cabi.org/isc/datasheet/51139
12. Jacaranda mimosifolia	naturalized	ornamental, landscape improvement, pharmaceutical, pesticide, timber, honey, fleuwood, deep-rooted competitive tree and very few plants or crops can grow beneath it, specially dense thickets along watercourse	Urban	https://www.cabi.org/isc/datasheet/29212
13. Melia azedarach	naturalized	agroforestry, soil improvement, fuelwood, ornamental, honey, oils, pesticide, poisonous to mammals, pharmaceutical	Urban	https://www.cabi.org/isc/datasheet/33144
14. Erythrina caffra	alien	unique appearance. Sandy, clay and loam soil, fairly drought resistant.	-	http://pza.sanbi.org/erythrina-caffra
15. Sophora japonica	alien	ornamental, edible leaves and flowers, pods are toxic,	-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:1119529-2
16. Lagunaria patersonia	alien		-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:561145-1
17. Schinus terebinthifolius	alien	aggressive woody weed in exotic locations, displacing native vegetation. Ornamental, erosion control, pesticide, revegetation, landscape improvement, honey, dye,	-	https://www.cabi.org/isc/datasheet/49031#tosummary-OfInvasiveness
18. Schinus molle	naturalized	agroforestry, ornamental, charcoal, fuelwood, dye, poisonous to mammals, wood	Urban	https://www.cabi.org/isc/datasheet/49028
19. Branchychiton populneus	alien	ornamental, drought tolerant	-	https://www.australianplants.com/plants.aspx?id=1072
20. Citrus aurantium	native	ornamental, food, oils	Agroforestry, urban, park	https://www.cabi.org/isc/datasheet/13440

21. Ficus benjamin	alien	fertilize during growing season once every two weeks. Likes consistency. Prefers humus-rich, moist, well-drained soil.	-	https://www.gardenia.net/plant/ficus-benjamina
22. Callistemon viminalis	alien	Drought resistent but prefers regular irrigation.	-	https://www.gardenia.net/plant/callistemon-viminalis
23. Ligustrum japonicum	alien	average, dry to medium, well-drained soill. Unpleasant aroma.	-	https://www.gardenia.net/plant/ligustrum-japonicum
24. Bauhinia variegata	naturalized	erosion control, wood, pharmaceutical, dye, ornamental, honey, very fast growing tree, invading and displacing native vegetation		https://www.cabi.org/isc/datasheet/8656
25. Plumbago capensis	alien	organically rich, well-drained soil. Tolerates drought.	-	https://www.gardenia.net/plant/plumbago-auriculata
26. Polygala myrtifolia	alien	prefers moist, fairly fertile, free-draining soil. Sunnt spot.	-	https://www.gardentags.com/plant-encyclopedia/polygala-myrtifolia/3832
27. Acokanthera sp.	alien	very poisonous	-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:2171-1
28. Nerium oleaner	native	extensive root system and is used to stabilize the soil in warmer areas, agroforestry, boundary, barrier or support, erosion control, landscape improvement, soil conservation, botanical garden, pesticide, poisonous to mammals		https://www.cabi.org/isc/datasheet/36220
29. Bougainvillea glabra	alien	low maintenance. Full sun, clay, high organic matter, loam and sand soil.	-	https://plants.ces.ncsu.edu/plants/bougainvillea-glabra/
30. Myrtus communis	native	drought tolerant, pleasant fragrance	Urban, park	https://www.gardenia.net/plant/myrtus-communis-common-myrtle
31. Dracaena draco	native	drought tolerant, water infrequently and deeply, not allow roots to remain wet. Very ornamental tree.	Urban, park	https://www.gardenia.net/plant/dracaena-draco-dragon-tree
32. Westringia fruticosa	alien	Rapid growth ground cover for extensive areas, full sun and soil with adequate drainage. Will cope with sandy soils, low watering requirement.	-	https://www.ozbreed.com.au/westringia/
33. Pittosporum tobira	alien	sweet orange scent, drought tolerant, very adaptable, soil cannot be constantly wet. Little maintenance,	-	https://www.gardenia.net/plant/pittosporum-tobira-nanum-mock-orange
34. Duranta repens	alien	landscape improvement, tolerates acidic to slightly alkaline soils). It prefers well drained, fertile soils and partial shade.	-	https://www.cabi.org/isc/datasheet/20192
35. Carissa grandiflora	alien	moderate drought tolerant, clay, sand, acidic, alkaline and loam soil. Expect for the ripe fruits, all parts are poisonous.	-	https://www.growables.org/information/TropicalFruit/carissa.htm
36. Jasmins (officinale, sambac,...)	alien	ornamental, perfumes	-	https://www.cabi.org/isc/datasheet/28388
37. Bougainvillier Janah	alien	fast-growing, needs a sturdy support such as a wall or fence. It needs full sun and moderate water. Bougainvillea blooms best in nutritionally poor soils. Many varieties have thorns.	-	https://nl.pinterest.com/pin/133771051410798422/
38. Cotinus coggygria	alien	ornamental	-	https://mountauburn.org/horticulture-highlight-cotinus-coggygria-smokebush/
39. Phormium tenax	alien	fibres, endagered, colonizes and converts native habitats, degrading them and making them less suitable for native species, agroforestry, erosion control, landscape improvement, revegetation	-	https://www.cabi.org/isc/datasheet/40302

Scientific name	Origin	Facts	Suitability	Source
40. Cordyline australis	alien	Poisonous to dogs/horses/cats. drought tolerant, very ornamental all year round.	-	https://www.gardenia.net/plant/cordyline-pink-passion-cabbage-tree
41. Solanum rantonnetii	alien	fast-growing, heat-tolerant, full sun, fragrant.	-	https://www.gardenia.net/plant/lycianthes-rantonnetii
42. Thuya occidentalis	alien	Intolerant of dry conditions.	-	https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=279599
43. Lavandula (multifida)	native	highly aromatic, subshrub, herb garden, dry to medium watering, tolerates dry soil and droughts.	Park, agroforestry, urban	https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=281617
44. Festuca glauca	alien	poor, moderatly fertile, well-drained soil, rock gardens.	-	https://www.gardenia.net/plant/festuca-glauca-beyond-blue
45. Acorus gramineus	alien	controls erosion on water banks. Medium to wet soil, low-maintenance,	-	https://www.gardenia.net/plant/acorus-gramineus-ogon
46. Gaura lindheimeri	alien	survives lenghty periods of drought. Thrives in sandy, loamy, well-drained soil, low-care.	-	https://www.gardenia.net/plant/gaura-lindheimeri-siskiyou-pink-beeblossom
47. Rosa (canina)	native	lightly scented, tolerant and undemanding, prickly stems. Full sun, humus-rich, moist, well-draind soil. Tolerates poor soils.	Park, urban	https://www.gardenia.net/plant/rosa-canina
48. Euryops (chrysanthemoides)	alien	ornamental, forms dense stands, which may displace native plant and animal species	-	https://www.cabi.org/ISC/datasheet/13290182
49. Gazania sp.	naturalized	sandy, well-drained soil. Will tolerate poor soil, heat and drought. Does not require lot of water, prefers hot weather. Soil erosion control, ridiculously easy to grow, expressive.	Urban	https://www.gardenia.net/plant/gazania-big-kiss-white-flame
50. Impatiens nouvelle Guinée	alien	very little maintenance, not drought-tolerant.	-	https://www.thespruce.com/care-for-new-guinea-impatiens-4122333
51. Dimorphotheca	alien	can easily be started from seed. Low-growing, half-hardy plant. Relatively simple to grow, well-drained soil and direct sunlight. Tolerates a range of soil types, prefers slightly sandy soil.	-	https://www.gardening-knowhow.com/ornamental/flowers/cape-marigold/learn-about-dimorphotheca-flowers.htm
52. Pervenche				
53. Pennisetum setaceum	native	erosion control, landscape improvement, soil conservation, botanical garden, ornamental	Park, urban	https://www.cabi.org/isc/datasheet/116202
54. Stipa tenuifolia	alien	ornamental grass, drought-tolerant	-	https://www.gardenia.net/plant/stipa-tenuissima-mexican-feather-grass
55. Cuphea sp.	alien	rich in nectar, easy to grow, heat and drought resistant, keep moist throughout growing season.	-	https://www.gardenia.net/plant/cuphea-david-verity
56. Nerium oleaner	native	extensive root system and is used to stabilize the soil in warmer areas, agroforestry, boundary, barrier or support, erosion control, landscape improvement, soil conservation, botanical garden, pesticide, poisonous to mammals	Linear park, urban	https://www.cabi.org/isc/datasheet/36220
57. Tulbaghia violacea	alien	sweetly fragrant, spread slowely, not agressively, good drought and heat tolerance, requires moist in growing season.	-	https://www.gardenia.net/plant/tulbaghia-violacea-society-garlic

The vegetation palette for Tamansourt by Al Omrane.

58. Arctotis sp.	alien	drought tolerant, rock gardens, sandy, consistently-moist, well-drained, flower closes at night.	-	https://www.gardenia.net/plant/arctotis-x-hybrida-pumpkin-pie-african-daisy
59. Géranium Lierre (pelargonium)	alien	spread by wind or animals	-	http://www.pelargonium.si/genus.html
60. Chrysanthemum	alien		-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:331492-2
61. Pétunia	alien	extremely easy to grow, moderately fertily, humus-rich, moist, well-drained soil	-	https://www.gardenia.net/plant/petunia-wave-purple-classic
62. Verbena officinalis	native	pharmaceutical, ornamental, tea, food garnish. Grows in all types of well-drained, moist and moderately fertile soils.	Agroforestry, urban	https://www.cabi.org/isc/datasheet/56184
63. Gnaphalium lanatum	alien		-	https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:205301-1
64. Rosmarinus prostratus	alien	herb, perfect for rock gardens, cascading down walls, excellent ground cover, especially when soil too dry, rocky or sandy for others. Poor, well-drained soils, full shun, drought tolerant.	-	https://www.gardenia.net/plant/rosmarinus-officinalis-prostratus-group-rosemary
65. Vinca major variegata	alien	dry soil and drought tolerant, hardy low-maintenance ground cover.	-	https://www.gardenia.net/plant/vinca-minor-variegata-periwinkle
66. Pennisetum clandestinum	introduced	an aggressive perennial plant. Ornamental, agroforestry, erosion control, landscape improvement, revegetation, soil conservation	-	https://www.cabi.org/isc/datasheet/39765
67. Hedera helix	native	climber, perfect groundcover, extremely ornamental, not fussy about soil, tolerates wide range of conditions. Drought tolerant. Toxic to dogs, cats and horses.	Urban, park	https://www.gardenia.net/plant/hedera-helix-anne-marie
68. Vinca major	alien	lovely groundcover, hanging baskets, dry soil and drought tolerant, excellent for underplanting shrubs, slopes and banks. low maintenance.	-	https://www.gardenia.net/plant/vinca-minor-variegata-periwinkle
69. Dorotheanthus bellidiformis	alien	sunny situation on dry soil.	-	https://en.hortipedia.com/Dorotheanthus-bellidiformis
70. Paspalum sp.	alien	dispersed by wind, water, animals, vehicles, machinery, and in contaminated soil and agricultural produce.	-	https://weeds.brisbane.qld.gov.au/weeds/paspalum

Scientific name	Origin	Facts	Suitability	Source
1. Whashingtonia robusta	naturalized	agroforestry	Urban	https://www.cabi.org/isc/datasheet/56708
2. Brachychiton populneus		Tolerant of dry conditions, dense shade, drought fodder, minimal impact on cropping, support honey production. Partly edible.	Urban, agroforestry, park	https://www.anbg.gov.au/gnp/interns-2002/brachychiton-populneus.html
3. Olea europea	native	olives	Agroforestry, park	https://www.cabi.org/isc/datasheet/37336
4. Acacia saligna	naturalized	Fast-growing, drought-tolerant nitrogen-fixing tree . Sand and soil stabilization, windbreaker, wood production, ornamental	Agroforestry, park, urban	https://www.cabi.org/isc/datasheet/2402
5. Retama raetam	native	Flourishes in arid to semi-arid conditions on poor (sandy) to fertile soils, extremely drought tolerant	Park, urban	https://keys.lucidcentral.org/demo/js_player/sew2/text/retama_raetam.htm
6. Pistacia lentiscus L.	native	Sunny, dry to moderately moist soil. Sandy loam or gritty loam substrate. Oils and pharmaceutical.	Park, agroforestry, urban	https://pfaf.org/user/Plant.aspx?LatinName=Pistacia+lentiscus
7. Yucca (Superba, Variegata, Nobilis, Mediostriata)		Full sun, warm, arid situation, well-drained soil, preferably rich, tolerates dry and sandy soils	Park, urban	*Abdelaziz, Driss, Hassane, Rania & Mohammed, 2022*
8. Cacti		salinity not demanding in water and high temperatures, improving soil conditions and sequestering carbon. * Cacti fiber is used as embroidery.	Park, urban	*Abdelaziz, Driss, Hassane, Rania & Mohammed, 2022*

** learnt during site visit in a traditional Moroccan shop.*

The vegetation species recommended by (Abdelaziz, Driss, Hassane, Rania & Mohammed, 2022).