



Food and Agriculture
Organization of the
United Nations



Federal Ministry
for Economic Cooperation
and Development



Ministry of Climate Change &
Environmental Coordination
Government of Pakistan

Guidelines and Lists of
**Suitable Tree Species for Plantation in Different
Silvo-Ecological Zones of Pakistan**

August 2023



Third-party Consortium of IUCN, FAO and WWF



Food and Agriculture
Organization of the
United Nations



Federal Ministry
for Economic Cooperation
and Development



Ministry of Climate Change &
Environmental Coordination
Government of Pakistan

Guidelines and Lists of
**Suitable Tree Species for Plantation in Different
Silvo-Ecological Zones of Pakistan**

Authors and Contributors

Authors

Javed Ahmed,

Technical Advisor, IUCN Pakistan

Asim Jamal

Project Manager, 3rd Party M&E Consortium, TBTP/GPP, IUCN Pakistan

Third Party M&E Consortium Contributors

FAO

Dr. Faizul Bari, NRM Advisor, FAO
Ms. Mehwish Ali, GIS Officer, FAO
Mr. Muhammad Afrasiyab, GIS/MRV Expert
Ms. Areesha Asghar, GIS Assistant
Mr. Muhammad Afzal, National Information Management Assistant

WWF

Mr. Kamran Hussain, Head WWF KP
Mr. Safeer Ullah, Monitoring Officer
Mr. Atif Ullah, Monitoring Officer
Mr. Muhammad Usama, Monitoring Officer
Mr. Khalil ur Rehman, Monitoring Officer
Mr. Abu Bakar, Monitoring Officer
Mr. Muhammad Sami, Monitoring Officer

IUCN

Ms. Fauzia Bilqis Malik, Program Coordinator, IUCN
Dr. Saeed Abbas, Biodiversity Expert, IUCN
Dr. Mayoor Khan, Project Officer, IUCN
Ms. Komal Ashraf, Data Analysis & Reporting Officer, IUCN
Dr. Muhammad Iqbal Sial, Consultant IUCN
Mr. Abdur Rauf Qureshi, Consultant IUCN
Mr. Atta Ullah Khan (Late), Consultant IUCN
Mr. Shams ul Haq Memon, Consultant IUCN
Mr. Dost Ali Nawaz, Resource Person IUCN

Federal Government Contributors

Syed Ghulam Qadir Shah, IGF, MoCC
Mr. Yaqub Ali, DIGF, MoCC
Mr. Amjad Ali, DPD Forest, Up-scaling Green Pakistan Programme
Mr. Naveed Ahmed, DPD, M&E, Up-scaling Green Pakistan Programme
Mr. Umar Farooq, Forest Officer, Up-scaling Green Pakistan Programme
Mr. Muhammad Waqas Khan, Forest Officer, Up-scaling Green Pakistan Programme
Mr. Hasham Khan, Forest Officer, Up-scaling Green Pakistan Programme
Mr. Hayat Ullah, Botanist, Up-scaling Green Pakistan Programme
Mr. Junaid Ali, Forest Officer, Up-scaling Green Pakistan Programme

Provincial/Regional Government Contributors

Balochistan

Mr. Ghulam Muhammad, CCF South
Mr. Syed Ali Imran, Project Director, Up-scaling Green Pakistan Programme
Mr. Umer Farooq Khan, CF, M&E, Up-scaling Green Pakistan Programme
Mr. Mansoor Ahmed Jaffar, DPD, Up-scaling Green Pakistan Programme
Mr. Muhammad Imran, DCF
Mr. Muhammad Essa, DCF

Punjab

Mr. Mehmood Ahmed, CCF, Planning
Mr. Saeed Tabbasum, Project Director, Up-scaling Green Pakistan Programme
Mr. Malik Muhammad Khan, CCF (Retired)
Mr. Muhammad Javid Gill, CCF
Mr. Muhammad Tariq Naseem, Additional Secretary
Dr. Abdul Aleem Ch, CCF (Retired)
Mr. Nasim Iqbal Butt, CF

Khyber Pakhtunkhwa

Mr. Ejaz Qadir, CCF, Central Southern Region I
Mr. Muhammad Junaid Diyar, Project Director, Up-scaling Green Pakistan Programme
Mr. Ibrahim Khan, Deputy Project Director, Up-scaling Green Pakistan Programme
Dr. Anwar Ali, Director, PFI

Sindh

Mr. Riaz Ahmad Wagan, PD, Up-scaling Green Pakistan Programme
Mr. Hyder Raza Khan, CF
Mr. Shehzad Sadiq Gill, Deputy Project Coordinator

Azad Jammu & Kashmir

Sardar Muhammad Naseer, CCF (Principal)
Syed Rashid Hussain Shah, Project Director, Up-scaling Green Pakistan Programme
Sheikh Abdul Hamid, CF Mirpur
Mr. Asad Mehmood, CF Reforestation

Gilgit Baltistan

Dr. Zakir Hussain, CCF, Forests, Wildlife and Parks
Mr. Muhammad Ismail, Project Director, Up-scaling Green Pakistan Programme
Mr. Jibrán Haider, DFO
Mr. Muhammad Iftikhar, DFO

CONTENTS

FOREWORD	iv
PREFACE	v
ACKNOWLEDGEMENTS	vi
ABBREVIATIONS AND ACRONYMS	vii
1. GUIDELINES FOR TREE PLANTING	1
1.1 Introduction	1
1.2 Silvo-ecological Zones	1
1.3 Nomenclature Changes	3
1.4 Tree Diversity	3
1.5 Guidelines for Roadside Plantations	5
1.6 URBAN FORESTRY	5
1.7 Planting of trees for Conservation of Birds and Pollinators	7
1.8 Planting Trees on Saline and Waterlogged Soils	7
1.9 Lists of Species Suitable for Different Silvo-ecological Zones	7
2. LISTS OF SUITABLE TREE SPECIES FOR DIFFERENT SILVO-ECOLOGICAL ZONES IN PAKISTAN	9
2.1 Suitable Species for Silvo-Ecological Zones in Balochistan	9
2.2 Suitable Species for Silvo-Ecological Zones in Khyber Pakhtunkhwa	17
2.3 Suitable Species for Different Silvo-Ecological Zones in Punjab	25
2.4 Suitable Species for Different Silvo-Ecological Zones in Sindh	35
2.5 Suitable Species for Different Silvo-Ecological Zones in AJK	41
2.6 Suitable Species for Silvo-Ecological Zones in Gilgit-Baltistan	47
3. ANNEXES	53
Annex 1. List of suitable trees for Urban Landscaping	53
1. Large Trees (height >15m)	53
2. Medium Trees (Height 7-15 m)	58
3. Small Trees	61
4. Shrubs	64
Annex 2. Tree Species Suitable for Bird Food and Pollinators	66
Annex 3. Tree Species Suitable for Saline and Waterlogged Soils	67
REFERENCES	68

FOREWORD

The guidelines and lists of suitable trees for different silvo-ecological Zones of Pakistan prepared by the Consortium of IUCN/FAO/WWF are very comprehensive. In addition to the ecological zones, the guidelines also include recommendations for urban forestry, planting along highways, trees for birds and pollinators conservation and tree planting on saline and waterlogged soils. At the time of independence in 1947, the forests covered only four percent area of Pakistan which is not sufficient to meet the environmental and socio-economic needs of the country. Over the period, Pakistan has been able to significantly increase the tree cover through afforestation and farm forestry.

Pakistan is faced with the impending challenges of climate change and acute shortage of water and other ecosystem goods and services. In view of these challenges, the Government of Pakistan have launched a massive afforestation programme. The emphasis is not just on planting trees but also on rehabilitation of degraded forest landscapes to their near natural conditions. Pakistan has been experiencing extreme heat events in recent past years and its impact is greatest on our cities because of inadequate green cover. Greening our cities will not only connect the citizens with nature, but also bring multitude of environmental and social benefits. The trees will reduce noise and air pollution, improve water recharge, reduce energy costs, and improve mental health.

It is the policy of the Government that native tree species should be used for tree plantation, except in the urban landscaping where many exotic flowering and shade plants have adapted well to the urban environment. The native, naturalized, and exotic trees have been clearly identified in the lists of trees in the guidelines. There are lots of choices of native trees for planting in different situations and therefore, the forestry professionals and all other stakeholders should choose species that are best adapted to the local ecology and are either native or naturalized.

The Government of Pakistan appreciates the efforts of the Consortium in preparing these guidelines. The forestry professionals and all other agencies engaged in tree planting should find these guidelines useful and should make use of these in their current and future programmes for afforestation and rehabilitation of degraded forest landscapes.

Syed Asif Hyder Shah
Federal Secretary
Ministry of Climate Change

PREFACE

The Ministry of Climate Change requested IUCN, FAO, and WWF to constitute a consortium for independent Monitoring & Evaluation of the Ten Billion Trees Tsunami Programme now called the Upscaling Green Pakistan Programme. During the planning for monitoring and evaluation, it was realized that there was no baseline information on suitable trees for planting in different ecological zones. It was therefore decided to prepare lists of suitable trees for different ecological zones in the provinces and territories of Pakistan.

The ecological zones for tree plantation have been designated as Silvo-ecological Zones on the analogy of the agroecological zones. The work is based on secondary sources of information and in consultation with the forestry departments of the provinces and the territories of Pakistan. This is first approximation of the silvo-ecological zones, and the lists of suitable trees are intended only for guidance of the professionals and agencies involved in tree plantation in Pakistan. It is hoped that the Forestry Departments in the provinces and the territories will continue to refine and fine tune the silvo-ecological zones and the lists of suitable species for tree plantations.

Javed Ahmed

Technical Advisor IUCN Pakistan

Asim Jamal

Project Manager, 3rd Party M&E
Consortium, Up-scaling Green
Pakistan Programme, IUCN Pakistan

ACKNOWLEDGEMENTS

The Consortium of IUCN/FAO/WWF for independent third monitoring of the Up-scaling Green Pakistan Programme gratefully acknowledges the trust that the Ministry of Climate Change has imposed in us for the monitoring and evaluation of the hallmark afforestation programme of international fame. The Consortium also acknowledges with thanks the technical and financial support of KfW during planning stage and the financial support of the BMZ for undertaking the monitoring and evaluation.

The Consortium is grateful to Dr Javed Ahmed, Technical Advisor of the Consortium, and Mr. Asim Jamal, Project Manager, 3rd Party M&E Consortium, UP-SCALING GREEN PAKISTAN PROGRAMME, for taking lead on preparing these guidelines, the silvo-ecological Zones, and the lists of suitable tree species for different land uses. This work would not have been possible without the technical support of the GIS Unit of the FAO Pakistan. Special thanks are due to Ms. Mehwish Ali (GIS Officer) for spearheading the mapping of the silvo-ecological zones and her team members Areesha Asghar (GIS Assistant), and Muhammad Afrasiyab (GIS Expert).

The Consortium also acknowledges the support and cooperation rendered by the Project Directors and senior professionals of the Forestry Departments of the provinces and territories. This work would not have been possible without the technical input provided by them. In addition, the Consortium is grateful to IUCN Consultants/Senior retired forestry professionals including Raja Atta Ullah Khan (Late), Dr Abdul Aleem Chaudhry, Dr. Muhammad Iqbal Sial, Mr. Shams ul Haq Memon and Mr. Abdur Rauf Qureshi for reviewing the drafts and making useful suggestions.

The Consortium hope that this document will provide a useful baseline for the M&E of the Up-scaling Green Pakistan Programme and help the Forestry Departments and other agencies in better planning for sites and species selection for afforestation and the rehabilitation of degraded forest landscapes in Pakistan.

Mr. Mahmood Akhtar Cheema
Country Representative
IUCN Pakistan

Ms. Florence Rolle
Representative
FAO Pakistan

Mr. Hammad Naqi Khan
Director General
WWF Pakistan

ABBREVIATIONS AND ACRONYMS

AJK	Azad Jammu & Kashmir
BMZ	Federal Ministry for Economic Cooperation and Development, Federal Republic of Germany
cm	Centimeter
CCF	Chief Conservator Forest
CF	Conservator Forest
DCF	Deputy Conservator Forest
DFO	Divisional Forest Officer
DPD	Deputy Project Director
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPP	Green Pakistan Programme
IUCN	International Union for Conservation of Nature
KfW	Kreditanstalt für Wiederaufbau
KP	Khyber Pakhtunkhwa
M	Meter
M&E	Monitoring & Evaluation
MRV	Magnetic Resonance Venography
PD	Project Director
TBTTP	Ten Billion Tree Tsunami Programme
TPM&E	Third-party Monitoring & Evaluation
WWF	World Wide Fund for Nature Conservation



© Ch. Javed Ahmed



1. GUIDELINES FOR TREE PLANTING

1.1 Introduction

The impending challenges of the loss of biodiversity and climate change have led to a major paradigm shift from production forestry to environmental forestry with a focus on restoration of ecosystems for mitigating climate change and conservation of biodiversity. The re-afforestation programs must ensure minimal disruption of ecosystem integrity, and maximization of ecosystem services including supporting community livelihoods in the form of economic livelihoods that would come, for example through the use of non-timber forest products by the local communities. Studies have shown that native and locally adapted trees are more resilient to climate change impacts and other environmental stresses than exotic species. Pakistan has a rich diversity of native trees, but unfortunately, fast growing exotics are preferred over native trees. The purpose of these guidelines is to promote a wider choice of suitable native and exotic tree species while planning tree plantations in different ecological zones. This guide has benefitted from the work of late Mehmood Iqbal Sheikh. The field guide for foresters prepared by the late M. I. Sheikh (1993) provides the foundation for these guidelines and recommendations on the choice of tree species for different climatic zones.

1.2 Silvo-ecological Zones

Ecological zone is a landscape unit that unites certain interrelated plant and animal communities with a particular environmental condition as part of an integrated system. The Food and Agriculture Organization (FAO) (2012) made ecological zones as a basis for classification and reporting of natural forests. FAO Ecological Zones that are represented in Pakistan are given in table 1. Sheikh (1992) used agroecological zones for recommending suitable species for different zones. At

that time, Pakistan was divided into only 10 agro-ecological zones. However, in recent years, the number of agro-ecological zones have been redefined at the provincial level. The trees have a wider ecological range as compared to agricultural crops, therefore, agroecological zones are not appropriate for being used as a base for trees suitable for different zones. In Pakistan, ecological zones are also not suitable basis for recommendations of suitable tree species, because irrigation has changed the ecology of large areas of the landscape,

The Government of Pakistan constituted a consortium of IUCN/FAO/WWF for independent 3rd party monitoring and evaluation of the 10 billion trees plantation target under the Green Pakistan Program. The consortium soon realized that there was no benchmark for evaluating the suitability of trees planted in different zones, therefore, it was decided to classify human modified landscapes into zone to be called Silvo-ecological Zones and prepare lists of trees suitable for planting in different regions of

Pakistan. The zones were primarily delineated based on variations in climate, topography, natural vegetation of the area, and modified environments through irrigation.

Many tree species have a wide distribution and are found naturally or can be cultivated across many ecological zones. However, every species has a niche where its growth is optimal. The lists of suitable trees for every silvo-ecological zone are organized into two parts – main species and subsidiary species. Main species include the species that are best suited for the zone and are commonly planted or found in that zone. The subsidiary species are those that are also found or planted in the zone but are not very common. Similarly, the list for every zone includes trees that are part of the natural vegetation of that zone, many of which are also cultivated outside of the natural forests as well. Due to local level variations in topography, edaphic factors, including availability of water, and purpose of planting, the choice of appropriate species for planting will rest with the professionals on the ground. The purpose

Table 1. Global Ecological Zones for FAO Forest Reporting

Climatic Domain ¹	Climate Region ²	Ecological Zone ³
Tropical	Not represented in Pakistan	
Sub-tropical	Warm temperate moist	Subtropical humid forest (only sub-humid forests occur in Pakistan)
	Warm temperate dry	Subtropical dry forest
		Subtropical steppe
		Subtropical desert
	Warm temperate moist or dry	Subtropical mountain systems
Temperate	Cool temperate moist	Temperate oceanic forest (not represented in Pakistan)
		Temperate continental forest
	Cool temperate dry	Temperate steppe Temperate desert
	Cool temperate moist or dry	Temperate mountain systems
Boreal	Not represented in Pakistan	
Polar	Not represented in Pakistan	

(Source : <https://www.fao.org/3/ap861e/ap861e.pdf>)

1. Climate domain: Area of relatively homogeneous temperature regime.
2. Climate region: Areas of similar climate.
3. Ecological zone: Area with broad, yet relatively homogeneous natural vegetation formations that are similar, but not necessarily identical, in physiognomy.

of the list of species is to help the professionals choose the most suitable species for the site. The zones and lists of tree species in different zones are first approximation and may need further refinement based on experiences in the field.

The species diversity in a natural forest and an ecosystem depends on the combination of geology, topography, and climate tied together by physical and biotic processes specific to any one site. Therefore, reliance must be placed on naturally occurring species for assisted natural regeneration or rehabilitation of degraded ecosystems. On the other hand, for tree plantation in different land use types, the choice of suitable species for planting is relatively large depending on the purpose and local ecological factors. The success of tree plantation in any area depends on the suitability of the species to local edaphic conditions. Pakistan with its diverse climate and topography presents challenges in the wise choice of species for planting in different ecological regions and for different land uses.

The species selected for planting should be suitable for ecological conditions and be planted and nursed in an appropriate way depending on the species requirements. Sheikh (1992) recommended suitable species for ten different agroecological zones of Pakistan. In view of the extraordinarily large variations in climate, landform, and soil, we have divided Pakistan into different silvo-ecological zones and made recommendations of trees suitable for different zones. The term Silvo-ecological Zone as used here is a land resource mapping unit, defined in terms of climate, landform, and soils, with a range of conditions suitable for a group of trees. In so far as possible, the nomenclature of the Silvo-ecological zones is based on climatic regions – sub-tropics and temperate, humidity – moist or dry, landform – mountains, hills, plateau, desert, and physiognomy – conifer, broadleaved, scrub, etc. The boundaries of the silvo-ecological zones have been drawn based on the available

temperature, rainfall, and evapo-transpiration maps and in consultation with the forestry professionals in the provinces and the territories. The zones and their boundaries described in this publication is the first approximation and it is hoped these will be refined and updated over time as more information becomes available.

1.3 Nomenclature Changes

Sometimes changes in the names of plant species take place due to purely nomenclatural reasons, that is, based on the rules of nomenclature. When an older name is discovered, it has priority over the current name which then becomes a synonym. Nomenclature changes have taken place for some species that we have known for years with a different name. The nomenclature of the trees and shrubs included in this publication that have changed are given in Table 2.

1.4 Tree Diversity

Diversity of trees is a key to a successful tree planting program. Many studies have shown that forests with diverse tree species grow at a faster rate, store more carbon and are more resistant to pests, diseases, and fires than trees in species-poor forests. A higher number of tree species increases the number of ecological niches and has also been shown to increase the number of associated species such as understory plants, birds, animals, and pollinators. Further studies have demonstrated that edges of forests and woods, where two niches transition, are richer in biodiversity than adjoining ecosystems. Therefore, planting numerous tree species on a site not only conserves more trees but also other organisms as well. A greater diversity of trees also considerably decreases the risks associated with forestation. For example, tolerance to biotic and abiotic stresses increases the probability that a small proportion of trees will die thus lowering the risk of all of them dying.

Table 2. List of valid species name with their synonyms

Valid Name	Synonym	Common Name
<i>Acacia saligna</i>	<i>Acacia cyanophylla</i>	Kikar
<i>Acer cappadocicum</i>	<i>Acer pictum</i>	Kilpattar
<i>Brachychiton populneus</i>	<i>Sterculia diversifolia</i>	Kurrajong
<i>Butea frondosa</i>	<i>Butea monosperna</i>	Dhak, Chhichhra
<i>Celtis caucasica</i>	<i>Celtis australis</i>	Batkhar
<i>Commiphora wightii</i>	<i>Commiphora mukul</i>	Guggul, Gugal
<i>Faidherbia albida</i>	<i>Acacia albida</i>	
<i>Fernandoa adenophylla</i>	<i>Heterophragma adenophyllum</i>	Nag Phalli
<i>Ficus auriculata</i>	<i>Ficus roxburghii</i>	Gugul, Hermul, Tussa, Tussi
<i>Grewia optiva</i>	<i>Grewia oppositifolia</i>	Dhaman, Dhamna, Pharwa, Biul, Bhewal
<i>Guaiacum officinale</i>	<i>Lignum vitae</i>	Lignum
<i>Jacaranda mimosifolia</i>	<i>Jacaranda ovalifolia</i>	Jacranda
<i>Melaleuca viminalis</i>	<i>Callistemon viminalis</i>	Bottle Brush
<i>Millettia pinnata</i>	<i>Pongamia glabra</i>	Sukh Chain
<i>Monoon longifolium</i>	<i>Polyalthia longirostris</i>	False Ashoka
<i>Pistacia chinensis</i>	<i>Pistacia integrima</i>	Kakar-Singhi,
<i>Platycladus orientalis</i>	<i>Thuja orientalis</i>	Mor Punkh
<i>Quercus baloot</i>	<i>Quercus ilex</i>	Brrein
<i>Salix karelinii</i>	<i>Salix himalayensis</i>	Willow, Beensa
<i>Senegalia modesta</i>	<i>Acacia modesta</i>	Phulai
<i>Senegalia senegal</i>	<i>Acacia Senegal</i>	Kikar, Khair
<i>Styphnolobium japonicum</i>	<i>Sophora japonica</i>	Sophora
<i>Syzygium cumini</i>	<i>Eugenia jambolana</i>	Jaman
<i>Taxus wallichiana</i>	<i>Taxus baccata</i>	Barmi, Thuna, Thoonii
<i>Tecomella undulata</i>	<i>Tecoma undulata</i>	Rohirro, Lahura
<i>Toona ciliata</i>	<i>Cedrela toona</i>	Toon
<i>Vachellia nilotica</i>	<i>Acacia nilotica</i>	Babul, Kikar
<i>Vachellia nilotica subsp. cupressiformis</i>	<i>Acacia arabica susp. cupressiformis</i>	Kabuli Kikar, Kikri
<i>Vachellia farnesiana</i>	<i>Acacia farnesiana</i>	Gu-Kikar
<i>Vachellia jacquemontii</i>	<i>Acacia jacquemontii</i>	Babri, Bouli, Ratabanli
<i>Zizyphus vulgaris</i>	<i>Zizyphus jujube</i>	Unab, Sinjli
<i>Zizyphus jujuba</i>	<i>Zizyphus mauritiana</i>	Ber

1.5 Guidelines for Roadside Plantations

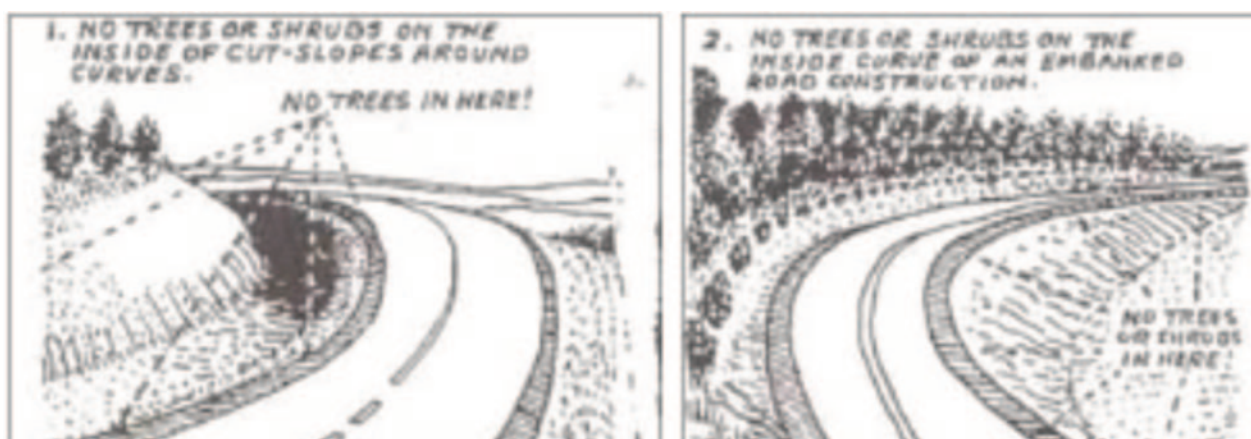
The purpose of highway planting is not only to provide shade but also to enhance the aesthetic value of the roads. Safety on highways, roads and streets is the important factor to contemplate when planning and designing roadside plantations. Trees on roadsides are hazard objects and can cause accidents if not properly planned and designed. Special mitigation measures are necessary to avoid collisions with trees. The roadside plantations should be in accordance with the tree plantation guidelines of the Highways Department, if any exist. Following are a few general guidelines:

- a) Plant large evergreen trees (10-15 m) in the outer row, followed by medium sized trees (up to 10 m) in the middle and flowering small trees, shrubs, or bushes in the inner row on either side of the road.
- b) Highway planting should achieve a mass effect for the viewer traveling at the assigned speed of the highway. It should also achieve a well-balanced combination of both planted areas and open grassy spaces.
- c) The plantations will look more beautiful and achieve better aesthetics if the same species is planted on both sides for at least one km, then another species.
- d) The species should be both functional and aesthetic, representative of the natural environment of the area.
- e) Native trees that promote bird and pollinator biodiversity may be planted in mixture with other trees.
- f) Tree form and shape should be used for harmony and contrast. Round headed or spreading plants form more desirable masses, while columnar or conical shapes add greater visual emphasis.
- g) Plant selection should emphasize the use of native plants to the greatest extent possible. Preference should be given to regional native plants.
- h) Avoid planting trees under overhead utility lines unless the mature tree size is less than the height of the lines.
- i) Avoid planting bushes that may obstruct drivers' view of pedestrians, livestock, and wildlife etc. crossing the roads.
- j) The trees, when grown up, should not obstruct the view of the motorists. This is especially important at intersections, sharp bends, and similar places. Any overgrown branches should be tended regularly.
- k) In hilly areas space for continuous planting may not be available hence single tree planting, blocks / group / groove planting at suitable place along or away from road but visible while travelling should be done.
- l) At suitable places, scenic points, water springs, rest point where space is available for parking, shady and ornamental trees and shrubs can be suitable.

1.6 Urban Forestry

Trees have countless benefits for our cities but unfortunately there is an absence of green spaces for urban and peri-urban forestry. The trees provide visual appeal to any area and research

Figure 1. Diagram showing no tree planting area on road curves



over the years has confirmed the immense value and benefits that mature urban trees offer to our cities. It is estimated that:

- For every 10 percent increase in urban tree canopy cover, ozone level in urban areas is reduced by 3-percent. Higher ozone levels are harmful for human health.
- Trees remove carbon from the air, getting absorbed and stored as cellulose in their trunks, branches, and leaves.
- Research has also shown a 60% reduction in particulate matter from car exhaust fumes on streets lined with trees.
- Trees constantly remove pollutants including sulfur dioxide, nitrogen oxides and particulate matter such as carbon monoxide, cadmium, nickel, and lead from the air.
- For every 5 percent of tree cover stormwater runoff is reduced by 2 percent.
- Trees shade and transpiration reduce temperatures. This helps reduce air conditioning bills and energy use.

Trees also increase the property values on tree lined streets. Trees have also been proven to present positive impacts against reagents causing skin cancer, asthma, hypertension, and other stress related illness by filtering out polluted air, reducing smog formation, providing shade from solar radiation, and providing an attractive, calming setting for recreation. Trees also form an effective sound absorbing barrier to help reduce urban noise pollution. The diversity of trees helps in providing natural habitats for birds, squirrels, reptiles, and other fauna.

Urban biodiversity is receiving global attention. IUCN has developed Urban Nature Indexes (UNI) to help cities understand their impacts on nature, set science-based targets for improvement, and monitor progress accordingly. Singapore has developed a City Biodiversity Index (or Singapore Index) as an environmental index for cities. The Index is a self-assessment tool for cities to evaluate and monitor the progress of their biodiversity conservation efforts against their own individual baselines. It comprises a) the “Profile of the City”, which provides background information on a city; and b) the 23 indicators that measure

native biodiversity, ecosystem services provided by biodiversity, and governance and management of biodiversity based on guidelines and methodology provided in the User’s Manual on the Singapore Index on Cities’ Biodiversity¹. It is recommended that this tool may be adopted and used for monitoring progress in urban forestry in mega cities of Pakistan.

Miyawaki method to create urban forests is gaining popularity around the globe. The Miyawaki method creates fascinating complex ecosystems, in balance with today’s soil and climate conditions. This technique works worldwide irrespective of soil and climatic conditions. Akira Miyawaki, Botanist, and professor is the inventor of the technique since 1980. He is a recipient of the 2006 Blue Planet Prize, which is the equivalent of a Nobel Prize in ecology. Using this methodology, we create native urban forest ecosystems much quicker. The method takes its inspiration directly from processes and diversity in nature: 15 to 30 different species of trees and shrubs are planted together. This plant community works very well together and is perfectly adapted to local weather conditions. The habitat thus created will get more complex over time and attract much biodiversity. Vegetation becomes much denser than conventional plantations, and it has the structure of a mature natural forest. It is a multi-story structure, where different levels of vegetation appear. The forest thus structured delivers many benefits in the form of ecosystem services.

There are many trees and shrubs that are available for planting in the urban landscapes of Pakistan for their colorful flowers, foliage, their shape or both for flowers and foliage, etc. The choice depends on the soil, availability of water, space available, presence of overhead powerlines, phone lines, streetlights etc. Generally native species are more adaptable and require less care than exotics. The list of species suitable for urban landscape (Annex 1) is organized into tall, medium, and short trees and shrubs. The list has a short description of the landscape characteristics of the species and climate zone for which the species are suitable.

<https://www.cbd.int/authorities/doc/Singapore-Index-User-Manual-20140730-en.pdf>

1.7 Planting of Trees for Conservation of Birds and Pollinators

Birds are an important component of an ecosystem, benefiting human beings in many ways. Birds matter tremendously, and their presence near to us in cities delivers delight. Spending time connected with the natural world is the perfect antidote to the pressures of modern life. Getting close to nature and especially listening to birds' songs and calls helps improve our mental and emotional health, happiness and wellbeing. They make cities more interesting, infusing urban neighborhoods and spaces with a life force. Birds eat insects, which is a natural way to control pests in gardens, on farms, and other places. A group of birds gliding through the air can easily eat hundreds of insects each day, proving effective functional biological control systems. There is a lot of evidence that spending time in nature has positive effects on human well-being. Hikers who heard the bird songs reported a greater sense of well-being than those who didn't. Therefore, any urban landscape or urban forestry plan must include trees that provide food and shelter. A list of suitable species for bird and pollinators biodiversity is given in annex 2. The *Ficus* species, especially the Pipal (*Ficus religiosa*), Gular (*Ficus glomerata*), and Bar (*Ficus bengalensis*) are most suitable for urban spaces, but unfortunately underrepresented in our urban landscapes. In addition, planting fruit and nectar trees in Important Bird Areas (IBA) and Key Biodiversity Areas (KBA) will also help conservation of pollinators and birds.

The pollinators are needed for the reproduction of 90% of flowering plants and one third of human food crops. Pollinators include bees, butterflies, moths, beetles, flies, birds, and bats. The survival of many pollinators in Pakistan is at stake due to heavy use of agrochemicals and loss of native habitats. Abundant and healthy populations of

pollinators can improve fruit quality and increase fruit size. In farming situations this increases production, and in the wild, biodiversity increases wildlife food sources. In addition, increase in honeybees can increase honey production and create livelihoods for the rural communities. While many flowering plants provide food for the wildlife and pollinators.

1.8 Planting Trees on Saline and Waterlogged Soils

Salinity is a common problem in irrigated areas, especially in areas of low rainfall and high rate of evaporation (arid and semi-arid regions). Saline soils are also found extensively in sub-humid and humid climates, particularly in the coastal regions where the ingress of sea water through estuaries and rivers and through groundwater causes large-scale salinization. Since saline soils contain a major salt accumulation in the upper 30 cm layer, seedlings are badly affected if planted at the surface. Sub-surface planting in holes of 15 cm diameter and 45 cm deep are dug and saplings are planted at a depth of 15 cm to minimize the adverse effects of high salinity. In irrigated agricultural land, waterlogging is often accompanied by soil salinity but occasionally waterlogged soils are not saline. Tree plantation on waterlogged areas is done by planting saplings on ridges about 40 cm in height.

A list of trees suitable for saline and waterlogged soils is given in annex 3.

1.9 Lists of Species Suitable for Different Silvo-ecological Zones

The lists of species suitable for different silvo-ecological zones in the provinces and the territories of Pakistan are given in the next section.

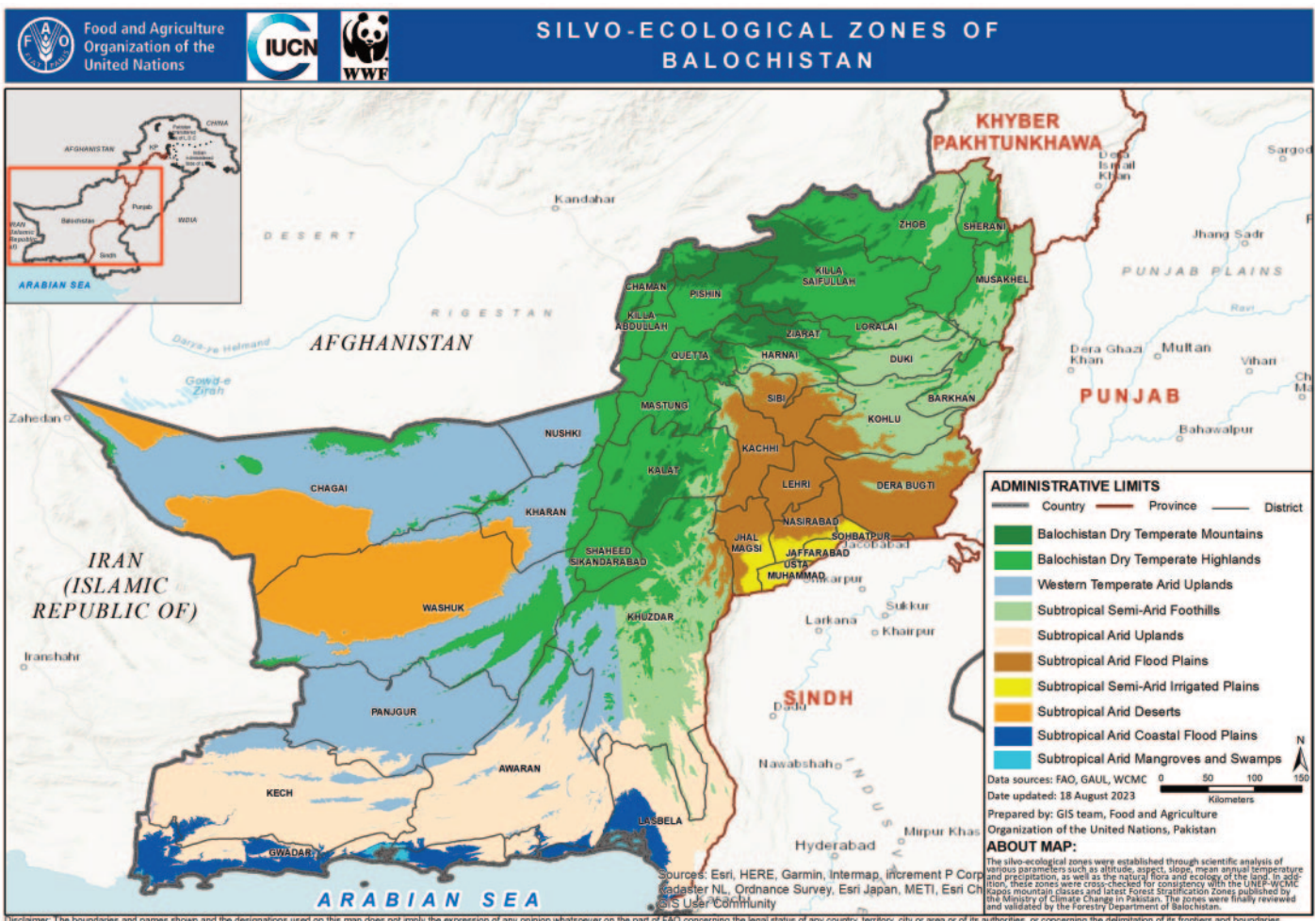


© Forest Department, Balochistan



2. LISTS OF SUITABLE TREE SPECIES FOR DIFFERENT SILVO-ECOLOGICAL ZONES IN PAKISTAN

2.1 Suitable Species for Silvo-Ecological Zones in Balochistan



1. Balochistan Dry Temperate Mountains

(Ziarat, Quetta, Kalat, Khuzdar, Mastung, Killa Abdullah, Pishin, Killa Saifullah, Zhub, Sherani and Musakhail districts, 2000 – 3500 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Juniperus excelsa</i>	Obusht, Hapurs	Native
<i>Pinus gerardiana</i>	Chilghoza	Native
<i>Pinus wallichiana</i>	Nashtar	Native
<i>Fraxinus xanthoxyloides</i>	Shishar, Shang	Native
<i>Pistacia khinjuk</i>	Shana, Kasur, khanjjak	Native
<i>Pistacia atlantica</i>	Gwan, Khanjak, Badwar	Native
<i>Morus alba</i>	Toot	Native
Subsidiary Species		
<i>Pinus halepensis</i>	Quetta Pine	Exotic
<i>Platanus orientalis</i>	Chinar	Native
<i>Fraxinus excelsior</i>	Quetta Ash	Native
<i>Elaeagnus angustifolia</i>	Sinjid, Sanzali	Native
<i>Robinia pseudoacacia</i>	Chambli	Naturalized
<i>Ailanthus altissima</i>	Asmani	Naturalized
<i>Pistacia vera</i>	Pista	Native
<i>Ficus carica</i>	Anjeer	Native
<i>Populus alba</i>	Sufeda	Native

2. Balochistan Dry Temperate Highlands

(Chagai, Kharan, Washuk, Nushki, Kalat, Khuzdar, Mastung, Killa Abdullah, Pishin, Killa Saifullah, Zhub, Sherani, Loralai, Musakhail, Barkhan and Harnai districts, 1300 – 2000 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Fraxinus xanthoxyloides</i>	Shishar, Shang	Native
<i>Pistacia khinjuk</i>	Shana, Kasur, khanjjak	Native
<i>Olea ferruginea</i>	Zaitoon	Native
<i>Tamarix aphylla</i>	Ghaz	Native
<i>Morus alba</i>	Toot	Native
Subsidiary Species		
<i>Pinus halepensis</i>	Quetta Pine	Exotic
<i>Fraxinus excelsior</i>	Quetta Ash	Native
<i>Platanus orientalis</i>	Chinar	Native
<i>Salix tetrasperma</i>	Gait, Wola	Native
<i>Ficus carica</i>	Anjeer	Native
<i>Pistacia vera</i>	Pista	Native
<i>Robinia pseudoacacia</i>	Chambli	Naturalized
<i>Ailanthus altissima</i>	Asmani	Naturalized
<i>Melia azedarach</i>	Bakain	Naturalized
<i>Populus alba</i>	Sufeda	Native

3. Western Temperate Arid Uplands

(Panjgur, Kalat, Kharan, Washuk, Chagai, Nushki, Suraab, Khuzdar, Awaran, and Kech districts, 300 to 1,300 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Fraxinus xanthoxyloides</i>	Shishar, Shang	Native
<i>Pistacia khinjuk</i>	Shana, Kasur, khanjjak	Native
<i>Olea ferruginea</i>	Kahu, Showan, Khat	Native
<i>Morus alba</i>	Toot	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Populus euphratica</i>	Bhan, Padah, Patak	Native
<i>Nannorrhops ritchiana</i>	Mazri, Pesh	Native
Subsidiary Species		
<i>Robinia pseudoacacia</i>	Chambli	Naturalized
<i>Ailanthus altissima</i>	Asmani	Naturalized
<i>Melia azedarach</i>	Bakain	Naturalized
<i>Salix tetrasperma</i>	Gait/ Wola	Naturalized
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Ficus carica</i>	Anjeer	Native
<i>Ziziphus mauritiana</i>	Ber	Native

4. Subtropical Semi-Arid Foothills

(Lasbella, Awaran, Khuzdar, Surab, Kachhi, Harnai, Sibi, Loralai, Duki, Dera Bugti, Kohlu, Barkhan, Musakhail and Sherani districts, 300 to 1,300 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia modesta</i>	Phulai	Native
<i>Olea ferruginea</i>	Kahu, Showan, Khat	Native
<i>Tecomella undulata</i>	Lahura, Papuk	Native
<i>Prosopis cineraria</i>	Kandi, Kahur	Native
<i>Senegalia senegal</i>	Khor	Native
<i>Vachellia jacquemontii</i>	Chish, Chagird	Native
<i>Vachellia nilotica</i>	Kikar, Babul	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Toot	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Nannorrhops ritchiana</i>	Mazri, Pesh	Native
<i>Prosopis juliflora</i>	Mesquite	Exotic
Subsidiary Species		
<i>Azadirachta indica</i>	Neem	Native
<i>Melia azedarach</i>	Bakain	Naturalized
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Azadirachta indica</i>	Neem	Native

Scientific Name	Local Name	Indigenous/Exotic
<i>Syzygium cumini</i>	Jaman	Native
<i>Albizia procera</i>	Safed Sharin	Native
<i>Albizia lebbeck</i>	Kala Sharin	Native
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Erythrina suberosa</i>	Gul-e-Nishtar	Naturalized

5. Subtropical Arid Uplands

(Kech, Awaran, Panjgur, Gwadar, Khuzdar and Lasbella districts, 30 to 300 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia senegal</i>	Khor	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Prosopis cineraria</i>	Kandi, Kahur	Native
<i>Vachellia Jacquemontii</i>	Chish, Chagird	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Capparis decidua</i>	Karil, Karir	Native
<i>Commiphora wightii</i>	Guggul, Guggar	Native
<i>Vachellia nilotica</i>	Kikar, Babul	Native
<i>Nannorrhops ritchiana</i>	Mazri, Pesh	Native
<i>Salvadora oleoides</i>	Peelu, Khabar	Native
Subsidiary Species		
<i>Ficus carica</i>	Anjeer	Native
<i>Salix tetrasperma</i>	Gait, Wola	Native
<i>Erythrina suberosa</i>	Gul-e-Nishtar	Naturalized
<i>Casuarina equisetifolia</i>	Jangli Saru	Naturalized
<i>Acacia victoriae</i>	Walayti Kikar	Naturalized
<i>Melia azedarach</i>	Bakain	Naturalized

6. Subtropical Arid Flood Plains

(Kachhi, Sibi, Jhal Magsi, Nasirabad, Kohlu and Dera Bugti districts, 30 to 300 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Prosopis cineraria</i>	Kandi, Kahur	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Vachellia nilotica</i>	Kikar, Babur	Native
<i>Salvadora oleoides</i>	Peelu, Khabar	Native
<i>Tamarix dioica</i>	Ghaz, Farash	Native
<i>Capparis decidua</i>	Karir, Karil	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Prosopis juliflora</i>	Mesquite	Exotic
Subsidiary Species		
<i>Azadirachta indica</i>	Neem	Native
<i>Melia azedarach</i>	Bakain	Naturalized
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Albizia procera</i>	Safed Sharin	Native
<i>Albizia lebeck</i>	Kala Sharin	Native
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Dalbergia sissoo</i>	Shisham	Native

7. Subtropical Semi-Arid Irrigated Plains

(Jhal Magsi, Nasirabad, Jaffarabad and Sohbatpur districts, 5 to 30 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Albizia lebeck</i>	Kala Sharin	Native
<i>Albizia procera</i>	Safed Sharin	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Syzygium cumini</i>	Jaman	Native
Subsidiary Species		
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Morus alba</i>	Toot	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Ficus religiosa</i>	Pipal	Native
<i>Ficus benghalensis</i>	Bargad	Native
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Conocarpus lancifolius</i>	Cono	Exotic

8. Subtropical Arid Deserts

(Washuk, Chagai, Nushki, and Kharan districts, 400 to 700 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Haloxylon ammodendron</i>	Taghaz	Native
<i>Haloxylon stocksii</i>	Khar, Barilla, Sajji.	Native
<i>Calligonum polygonoides</i>	Pogh	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Tamarix dioica</i>	Ghaz, Farash	Native
Subsidiary Species		
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Conocarpus lancifolius</i>	Cono	Exotic
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Albizia procera</i>	Safed Sharin	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Phoenix dactylifera</i>	Khajoor, Khurma	Native

9. Subtropical Arid Coastal Flood Plains

(Gwadar, Awaran, Lasbella, Hub districts, 0 to 5 m asl)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Vachellia nilotica</i>	Kikar, Babur	Native
<i>Senegalia senegal</i>	Khor	Native
<i>Prosopis cineraria</i>	Kandi, Kahur	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Salvadora oleoides</i>	Peelu, Khabar	Native
<i>Ziziphus mauritiana</i>	Ber, Karkan	Native
<i>Vachellia jacquemontii</i>	Chish, Chagird	Native
<i>Prosopis juliflora</i>	Mesquite	Exotic
Subsidiary Species		
<i>Acacia saligna</i>	Kikar	Exotic
<i>Casuarina equisetifolia</i>	Jangli Saru	Naturalized
<i>Conocarpus lancifolius</i>	Cono	Exotic
<i>Ficus religiosa</i>	Pipal	Native
<i>Capparis decidua</i>	Karir	Native
<i>Pithecellobium dulce</i>	Jungle Jalaibi	Naturalized
<i>Azadirachta indica</i>	Neem	Native
<i>Erythrina suberosa</i>	Gul-e-Nishtar	Naturalized
<i>Albizia procera</i>	Safed Sharin	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Phoenix dactylifera</i>	Khajoor, Khurma	Native

10. Subtropical Arid Mangroves and Swamps

(Gawadar, Lasbella, and Hub districts)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Haloxylon ammodendron</i>	Taghaz	Native
<i>Aegiceras corniculatum</i> *	Not known	Native
<i>Avicennia marina</i>	Tivar, Timmar	Native
<i>Rhizophora apiculata</i> *	Not known	Native
<i>Rhizophora mucronata</i>	Kumri	Native
<i>Ceriops tagal</i>	Kain	Native

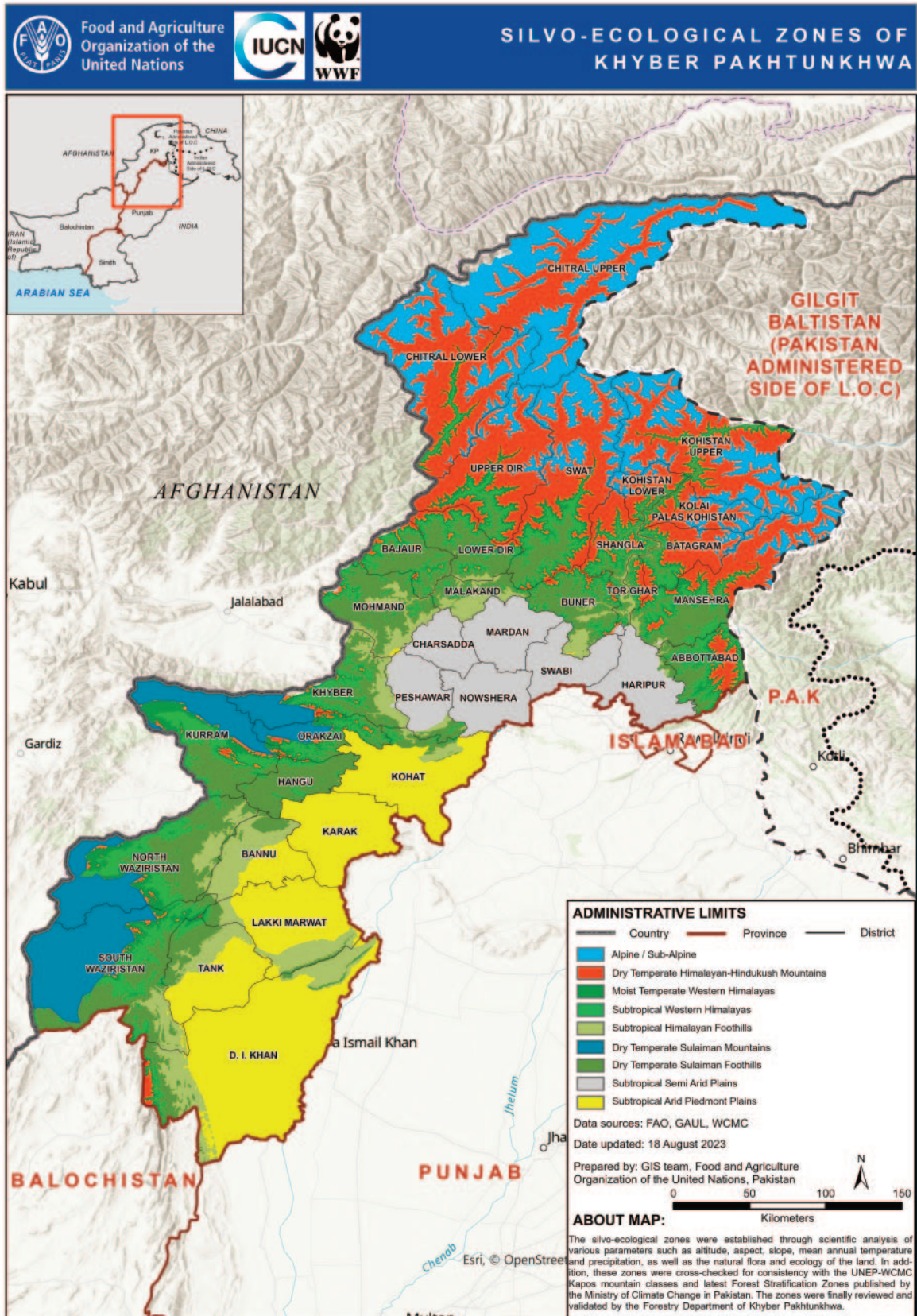
* Reported in Flora of Pakistan but probably extinct in the field.

11. Farm Forestry Trees

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Punica granatum</i>	Anar	Native
<i>Salix tetrasperma</i>	Gait, Wola	Native
<i>Populus sp.</i>	Poplar	Naturalized
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Juglans regia</i>	Akhrot	Native
<i>Olea europaea</i>	Zaitoon	Naturalized
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Prunus amygdalus</i>	Badam	Native
<i>Ficus carica</i>	Anjeer	Native
<i>Cordia dichotoma</i>	Lasura	Native
<i>Morus alba</i>	Toot	Native
<i>Tamarindus indica</i>	Imli	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Lawsonia inermis</i>	Mehndi	Native
<i>Mangifera indica</i>	Mango, Aam	Native
<i>Phoenix dactylifera</i>	Khajoor, Khurma	Native
<i>Manilkara zapota</i>	Cheeku	Naturalized
<i>Elaeagnus angustifolia</i>	Sinjid, Sanzali	Naturalized
<i>Leucaena leucocephala</i>	Iple Iple	Naturalized
<i>Bombax ceiba</i>	Simel	Naturalized
<i>Sesbania grandiflora</i>	Jantar	Native
<i>Populus alba</i>	Sufeda	Native



2.2 Suitable Species for Silvo-Ecological Zones in Khyber Pakhtunkhwa



1. Alpine/subalpine

Note: Sub-alpine zone is an ecologically sensitive area, and the land should not be disturbed for tree planting. The list of species for this zone is only for the purpose of assisted natural regeneration.

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Betula utilis</i>	Birch	Native
<i>Juniper Spp.</i>	Juniper	Native
<i>Salix spp.</i>	Willow	Native

2. Dry Temperate Himalayan-Hindukush Mountain Range

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Cedrus deodara</i>	Deodar	Native
<i>Pinus gerardiana</i>	Chilghoza	Native
<i>Pinus wallichiana</i>	Kail, Biar, Blue pine	Native
<i>Quercus semecarpifolia</i>	Brown oak	Native
<i>Quercus baloot</i>	Holy oak	Native
<i>Salix spp.</i>	Willow	Native
<i>Fraxinus xanthoxyloides</i>	Sum	Native
<i>Platanus orientalis</i>	Chinar	Native
<i>Juglans regia</i>	Walnut, Akhrot	Native
<i>Aesculus indica</i>	Indian Horse chestnut	Native
<i>Morus nigra</i>	Black Mulberry, Toot	Native
<i>Morus alba</i>	Mulberry, Toot	Native
<i>Populus ciliata</i>	Himalayan Poplar, Safeda	Native
<i>Robinia pseudoacacia</i>	Black Locust, Kikar	Naturalized
<i>Ailanthus altissima</i>	Ailanthus	Exotic
<i>Elaeagnus angustifolia</i>	Russian Olive, Sinjoor	Native
Subsidiary Species		
<i>Acer caesium</i>	Maple	Native
<i>Fraxinus hookeri</i>	Ash	Native
<i>Pistacia khinjuk</i>	Khinjuk	Native
<i>Prunus padus</i>	Kala Kath, Bird cherry	Native
<i>Celtis caucasica</i>	Honey Berry	Native
<i>Salix babylonica</i>	Weeping Willow	Naturalized
<i>Gleditsia triacanthos</i>	Honey Locust	Exotic

3. Moist Temperate Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Abies pindrow</i>	Fir	Native
<i>Pinus wallichiana</i>	Blue pine	Native
<i>Picea smithiana</i>	Spruce	Native
<i>Taxus baccata</i>	Burmi	Native
<i>Quercus dilatata</i>	Barungi	Native
<i>Quercus glauca</i>	Banni	Native
<i>Aesculus indica</i>	Bankhor	Native
<i>Juglans regia</i>	Walnut, Akhrot	Native
<i>Cedrela serrata</i>	Drawi	Native
<i>Ailanthus excelsa</i>	Tree of Heaven	Native
<i>Ailanthus altissima</i>	Ailanthus	Naturalized
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Naturalized
<i>Acer oblongum</i>	Panhgor	Native
<i>Platanus orientalis</i>	Chinar	Native
<i>Toona ciliata</i>	Toon	Native
Subsidiary Species		
<i>Alnus nitida</i>	West Himalayan Alder, Sharol	Native
<i>Fraxinus xanthoxyloides</i>	Sum	Native
<i>Diospyros lotus</i>	Amlok	Native
<i>Ficus palmata</i>	Jungli Anjeer	Native
<i>Gleditsia triacanthos</i>	Honey Locust	Exotic
<i>Salix spp.</i>	Willow	Native
<i>Platanus orientalis</i>	Chinar	Native
<i>Populus ciliata</i>	Himalayan Poplar, Safeda	Native
<i>Prunus padus</i>	Kala Kath, Bird Cherry	Native
<i>Pyrus pashia</i>	Batangi	Native
<i>Eucalyptus camaldulensis</i>	Safeda	Exotic

4. Subtropical Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus roxburghii</i>	Chir pine	Native
<i>Quercus incana</i>	White Oak, Bunj	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Cassia fistula</i>	Amaltas	Native
<i>Phyllanthus emblica</i>	Amla	Native
<i>Sapindus mukorossi</i>	Ritha	Exotic
Subsidiary Species		
<i>Alnus nitida</i>	West Himalayan Alder, Sharol	Native
<i>Cordia dichotoma</i>	Lasura	Native

Scientific Name	Local Name	Indigenous/Exotic
<i>Cordia myxa</i>	Goondi	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Ficus palmata</i>	Anjeer	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Morus alba</i>	Mulberry, Toot	Native
<i>Pistacia integerrima</i>	Guli-pista, Kangar	Native
<i>Salix tetrasperma</i>	Indian Willow	Native
<i>Terminalia bellirica</i>	Bahera	Native
<i>Punica granatum</i>	Danu, Annar	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Ziziphus jujuba</i>	Unab	Native
<i>Ailanthus altissima</i>	Ailanthus	Naturalized
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Naturalized
<i>Sapindus mukorossi</i>	Ritha	Exotic
<i>Eucalyptus tereticornis</i>	Safeda, lachi	Exotic

5. Subtropical Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Olea ferruginea</i>	Kahu	Native
<i>Senegalia modesta</i>	Phulai	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Cassia fistula</i>	Amaltas	Native
<i>Phyllanthus emblica</i>	Amla	Native
<i>Sapindus mukorossi</i>	Ritha	Native
Subsidiary Species		
<i>Cordia dichotoma</i>	Lasura	Native
<i>Cordia myxa</i>	Goondi	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Mulberry, Toot	Native
<i>Ailanthus altissima</i>	Ailanthus	Naturalized
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Naturalized
<i>Eucalyptus spp</i>	Safeda, Lachi	Exotic

6. Dry Temperate Sulaiman Mountains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Cedrus deodara</i>	Deodar	Native
<i>Pinus gerardiana</i>	Chilghoza	Native
<i>Pinus wallichiana</i>	Kail, Biar, Blue pine	Native
<i>Senegalia modesta</i>	Phulai	Native
Subsidiary Species		
<i>Albizia lebbeck</i>	Black Siris	Native
<i>Gmelina arborea</i>	Gumhar	Exotic
<i>Vachellia nilotica</i>	Babur, Kikar	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Mulberry	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Ficus carica</i>	Fig	Native
<i>Cassia fistula</i>	Amaltas	Native
<i>Butea monosperma</i>	Dhak	Native
<i>Olea ferruginea</i>	Kahu	Native
<i>Vachellia nilotica subsp. cupressiformis</i>	Kabuli Kikar	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic

7. Dry Temperate Sulaiman Foothills

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus roxburghii</i>	Chir	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Mulberry	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Bombax ceiba</i>	Simel	Native
Subsidiary Species		
<i>Albizia lebbeck</i>	Black Siris	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Gmelina arborea</i>	Gumhar	Native
<i>Ficus religiosa</i>	Sacred Fig, Pipal	Native
<i>Ficus benghalensis</i>	Bar	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Populus deltoides</i>	Poplar	Exotic
<i>Syzygium cumini</i>	Jaman	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Sesbania sesban</i>	Jantar	Exotic
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic

8. Subtropical Semi-Arid Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Albizia lebbbeck</i>	Black Siris	Native
<i>Albizia procera</i>	Safed Siris	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Terminalia arjuna</i>	Arjun	Native
Subsidiary Species		
<i>Ficus carica</i>	Fig	Native
<i>Millettia pinnata</i>	Sukh Chain	Exotic
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Senegalia modesta</i>	Phulai	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Gmelina arborea</i>	Gumhar	Exotic
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic

9. Subtropical Arid Piedmont Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Prosopis cineraria</i>	Jand	Native
<i>Terminalia arjuna</i>	Arjun	Native
Subsidiary Species		
<i>Albizia lebbbeck</i>	Black Siris	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Gmelina arborea</i>	Gumhar	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Ficus religiosa</i>	Sacred Fig, Pipal	Native
<i>Ficus benghalensis</i>	Bar	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Populus deltoides</i>	Poplar, Safeda	Exotic
<i>Syzygium cumini</i>	Jaman	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Sesbania sesban</i>	Jantar	Exotic
<i>Eucalyptus camaldulensis</i>	Sufeda, Laachi	Exotic

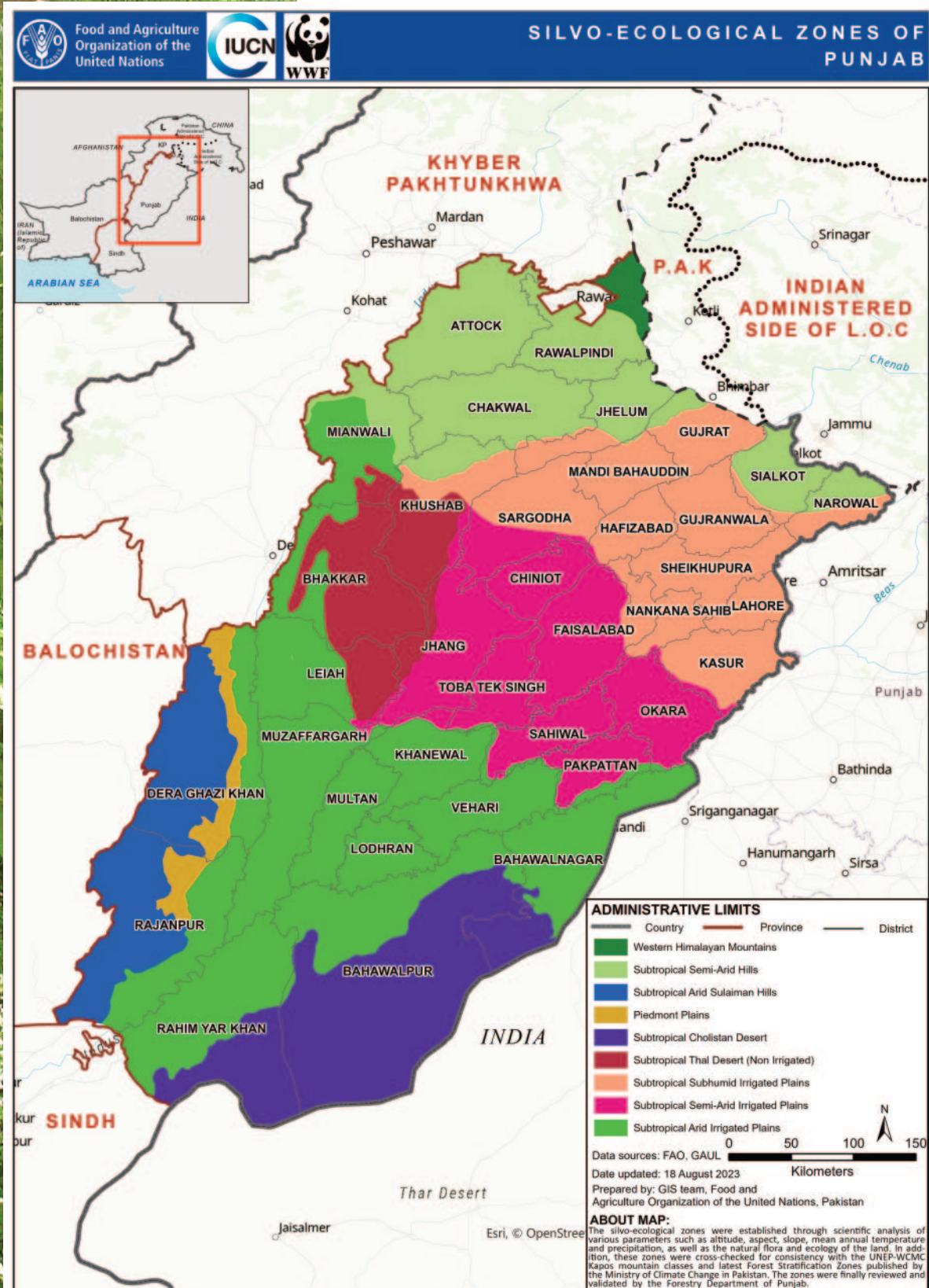
10. Farm Forestry Trees

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Acacia nilotica</i>	Kikar	Native
<i>Albizia lebbbeck</i>	Siris	Native
<i>Ailanthus altissima</i>	Ailanthus	Exotic
<i>Bombax ceiba</i>	Simel	Naturalized
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Casuarina equisetifolia</i>	Jungli Saru	Naturalised
<i>Cassia fistula</i>	Amaltas	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Elaeagnus angustifolia</i>	Sinjoor/Russian Olive	Native
<i>Eucalyptus camaldulensis</i>	Lachi	Exotic
<i>Ficus carica</i>	Anjeer	Native
<i>Hippophae rhamnoides</i>	Seabuckthorn	Native
<i>Juglans regia</i>	Akhrot	Native
<i>Leucaena leucocephala</i>	Iple Iple	Naturalized
<i>Morus alba</i>	Toot	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Olea europaea</i>	Zaitoon	Naturalized
<i>Platanus orientalis</i>	Chinar	Native
<i>Populus sp.</i>	Poplar	Naturalized
<i>Phoenix dactylifera</i>	Khajoor, Khurma	Native
<i>Punica granatum</i>	Danu Anar	Native
<i>Populus alba</i>	Safeda	Naturalized
<i>Robinia pseudoacacia</i>	Kikar	Naturalized
<i>Syzygium cumini</i>	Jaman	Native
<i>Salix tetrasperma</i>	Gait, Wola	Native
<i>Tamarix aphylla</i>	Ghaz, Farash	Native
<i>Zizyphus mauritiana</i>	Ber	Native

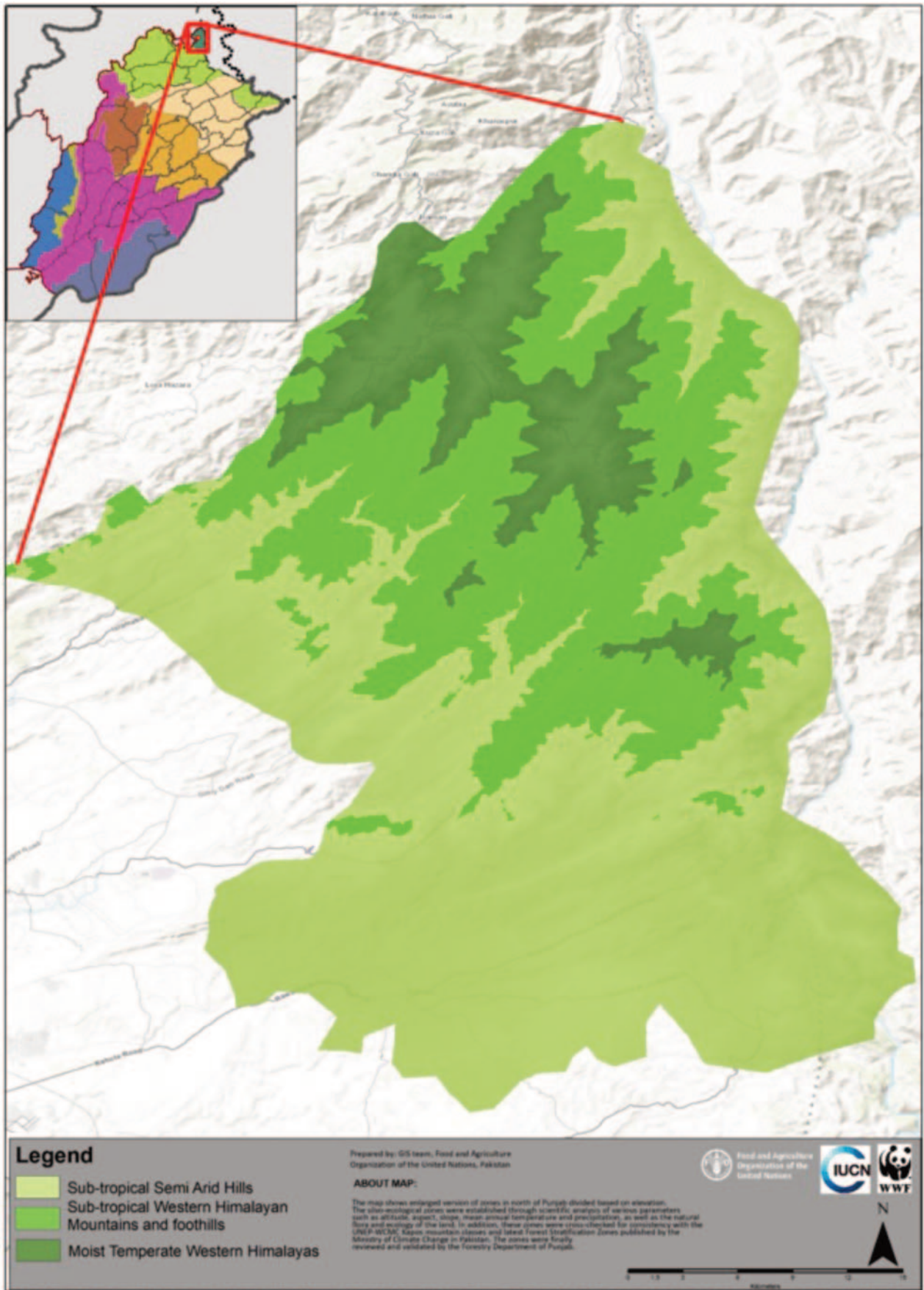




2.3 Suitable Species for Different Silvo-Ecological Zones in Punjab



Vegetation types within the Western Himalayan Mountains in Punjab



1. Western Himalayan Mountains

The Western Temperate Himalayan Mountain Region in the Punjab is composed of three distinct vegetation types: (a) Moist Temperate Forests, (b) Subtropical Chir-Pine forests, and (c) Subtropical Mixed Deciduous Forests. These vegetation types have not been mapped and furthermore because of the small area, is difficult to show these small zones on the map. The zones gradually transition from one to the other, therefore, these have many species in common. However, for the sake of convenience, the list of common species in the three zones are listed separately.

a. Moist Temperate Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus wallichiana</i>	Blue Pine	Native
<i>Abies pindrow</i>	Fir	Native
<i>Picea smithiana</i>	Spruce	Native
<i>Acer oblongum</i>	Panhgor, Trikken	Native
<i>Aesculus indica</i>	Bankhor	Native
<i>Juglans regia</i>	Walnut	Native
<i>Populus ciliate</i>	Himalayan Poplar	Native
<i>Quercus dilatate</i>	Barungi	Native
<i>Quercus glauca</i>	Banni	Native
Subsidiary Species		
<i>Taxus wallichiana</i>	Burmi, Thuna	Native
<i>Ilex dipyrena</i>	Kanderu	Native
<i>Aesculus indica</i>	Ban Khor	Native
<i>Cornus macrophylla</i>	Kandara	Native
<i>Cornus oblonga</i>	Ban Kukar	Native
<i>Diospyros lotus</i>	Amlok	Native
<i>Albizia chinensis</i>	Ohi	Native
<i>Prunus cornuta</i>	Bird Cherry	Native
<i>Prunus padus</i>	Kala Kath, Bird Cherry	Native
<i>Pyrus pashia</i>	Batangi	Native

b. Subtropical Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus wallichiana</i>	Blue Pine	Native
<i>Pinus roxburghii</i>	Chir Pine	Native
<i>Quercus incana</i>	White Oak/ Reen	Native
<i>Juglans regia</i>	Walnut, Akhrot	Native
<i>Sapindus mukorossi</i>	Ritha	Native
<i>Terminalia bellirica</i>	Bahera	Native
Subsidiary Species		
<i>Bauhinia purpurea</i>	Kachnar	Native
<i>Bauhinia variegata</i>	Kachnar	Native
<i>Pistacia khinjuk</i>	Gul-i-pista	Native

Scientific Name	Local Name	Indigenous/Exotic
<i>Zanthoxylum armatum</i>	Timmer	Native
<i>Ziziphus jujuba</i>	Unab	Native
<i>Punica granatum</i>	Anar Danna	Native
<i>Salix tetrasperma</i>	Indian Willow	Native

c. Subtropical Western Himalayan Foothills

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia modesta</i>	Phulai	Native
<i>Cassia fistula</i>	Amaltas	Native
<i>Cordia dichotoma</i>	Lasuri	Native
<i>Cordia myxa</i>	Lasura	Native
<i>Olea ferruginea</i>	Kahu	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Phyllanthus emblica</i>	Amla	Native
<i>Bauhinia purpurea</i>	Kachnar	Native
<i>Dalbergia sissoo</i>	Shisham	Native
Subsidiary Species		
<i>Sapindus mukorossi</i>	Ritha	Native
<i>Morus alba</i>	Mulberry	Native
<i>Bombax ceiba</i>	Simel	Native
<i>Acacia catechu</i>	Katha	Native

2. Subtropical Semi-Arid Hills

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia modesta</i>	Phulai	Native
<i>Olea ferruginea</i>	Kahu	Native
<i>Bauhinia purpurea</i>	Qarmazi Kachnar	Native
<i>Bauhinia variegata</i>	Kachnar	native
<i>Cassia fistula</i>	Amaltas	Native
<i>Morus alba</i>	Mulberry	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Vachellia nilotica</i>	Kikar	Native
<i>Vachellia nilotica subsp. cupressiformis</i>	Kabuli Kikar	Native
<i>Albizia lebbbeck</i>	Black Siris	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Ficus carica</i>	Fig	Native
<i>Cordia dichotoma</i>	Lasuri	native
Subsidiary Species		
<i>Cordia myxa</i>	Lasura	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Tecomella undulata</i>	Lahura	Native

Scientific Name	Local Name	Indigenous/Exotic
<i>Tamarix aphylla</i>	Farash	Native
<i>Butea monosperma</i>	Dhak	Native
<i>Ficus virens</i>	Pilkhan	Native
<i>Crateva religiosa</i>	Barna	Native
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Capparis decidua</i>	Dela, Karir	Native
<i>Buddleia globosa</i>	Orange Ball Tree	Native

3. Subtropical Arid Sulaiman Hills

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia modesta</i>	Phulai	Native
<i>Olea ferruginea</i>	Kahu	Native
<i>Tecomella undulata</i>	Lahura	Native
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Salvadora oleoides</i>	Peelu	Native
<i>Capparis decidua</i>	Dela, Karir	Native
Subsidiary Species		
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Nannorrhops ritchiana</i>	Mazri	Native
<i>Ficus palmata</i>	Phagwara, Hanjeer	Native
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Albizia lebbeck</i>	Black Siris	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Ailanthus altissima</i>	Asmani	Naturalized
<i>Vachellia farnesiana</i>	Gu-Kikar, Sweet Acacia	Exotic

4. Piedmont Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Salvadora oleoides</i>	Peelu	Native
<i>Vachellia jacquemontii</i>	Kikar	Native
<i>Vachellia nilotica</i>	Kikar	Native
<i>Albizia lebbeck</i>	Black Siris	Native
<i>Ziziphus mauritiana</i>	Ber	Native
Subsidiary Species		
<i>Capparis decidua</i>	Dela, Karir	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Eucalyptus camaldulensis</i>	Safeda	Exotic
<i>Conocarpus acuminatus</i>	Conocarpus	Exotic
<i>Cassia nodosa</i>	Pink Cassia	Exotic

5. Subtropical Cholistan Desert

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Salvadora oleoides</i>	Peelu	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Capparis decidua</i>	Dela/ Karir	Native

6. Subtropical Thal Desert (Non-irrigated)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Salvadora oleoides</i>	Peelu	Native
<i>Albizia lebbek</i>	Black Siris	Native
<i>Ziziphus mauritiana</i>	Ber	Native
Subsidiary Species		
<i>Azadirachta indica</i>	Neem	Native
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Vachellia nilotica</i>	Babul	Native
<i>Capparis decidua</i>	Dela, Karir	Native
<i>Eucalyptus camaldulensis</i>	Safeda	Exotic
<i>Conocarpus acuminatus</i>	Conocarpus	Exotic
<i>Cassia nodosa</i>	Pink Cassia	Exotic

7. Subtropical Subhumid Irrigated Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Terminalia arjuna</i>	Arjun	Native
<i>Terminalia bellirica</i>	Bahera	Native
<i>Gmelina arborea</i>	Gumhar	Native
<i>Bombax ceiba</i>	Simal	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Albizia lebbek</i>	Black Siris	Native
<i>Melia azedarach</i>	Bakain	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Vachellia nilotica</i>	Kikar	Native
Subsidiary Species		
<i>Senegalia modesta</i>	Phulai	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Moringa pterygosperma</i>	Sohanjna	Native

Scientific Name	Local Name	Indigenous/Exotic
<i>Tecomella undulata</i>	Lahura	Native
<i>Cordia dichotoma</i>	Lasura	Native
<i>Cordia myxa</i>	Goondi	Native
<i>Millettia pinnata</i>	Sukh Chain	Native
<i>Populus deltoides</i>	Poplar	Exotic
<i>Populus euphratica</i>	Bahan	Native
<i>Ficus carica</i>	Fig, Anjeer	Native
<i>Bischofia javanica</i>	Prota, Bishop Wood	Native
<i>Salvadora oleoides</i>	Peelu/Vun	Native
<i>Ficus virens</i>	Pilkan	Native

8. Subtropical Semi-Arid Irrigated Plains

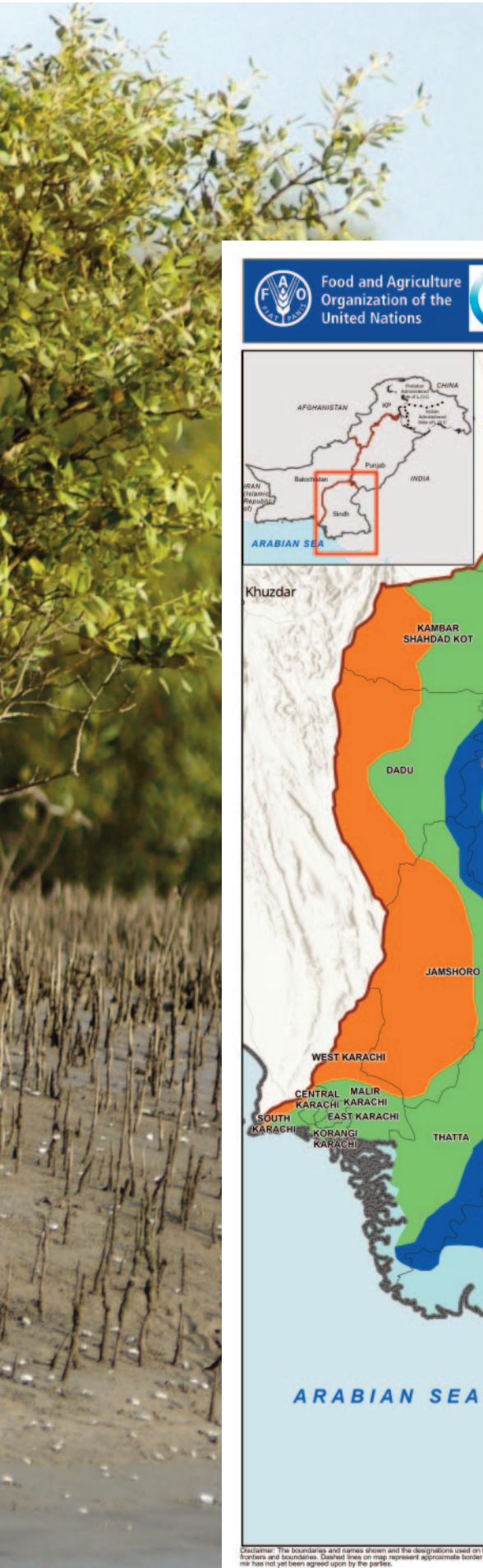
Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Mulberry	Native
<i>Terminalia arjuna</i>	Arjun	Native
<i>Gmelina arborea</i>	Gumhar	Exotic
<i>Bombax ceiba</i>	Simal	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Albizia lebbbeck</i>	Black Siris	Native
<i>Melia azedarach</i>	Bakain	Native
Subsidiary Species		
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Salvadora oleoides</i>	Peelu	Native
<i>Bischofia javanica</i>	Prota, Bishop Wood	Native
<i>Salvadora oleoides</i>	Peelu, Vun	Native
<i>Ficus virens</i>	Pilkan	Native
<i>Prosopis cineraria</i>	Jand, Kandi	Native

8. Subtropical Semi-Arid Irrigated Plains

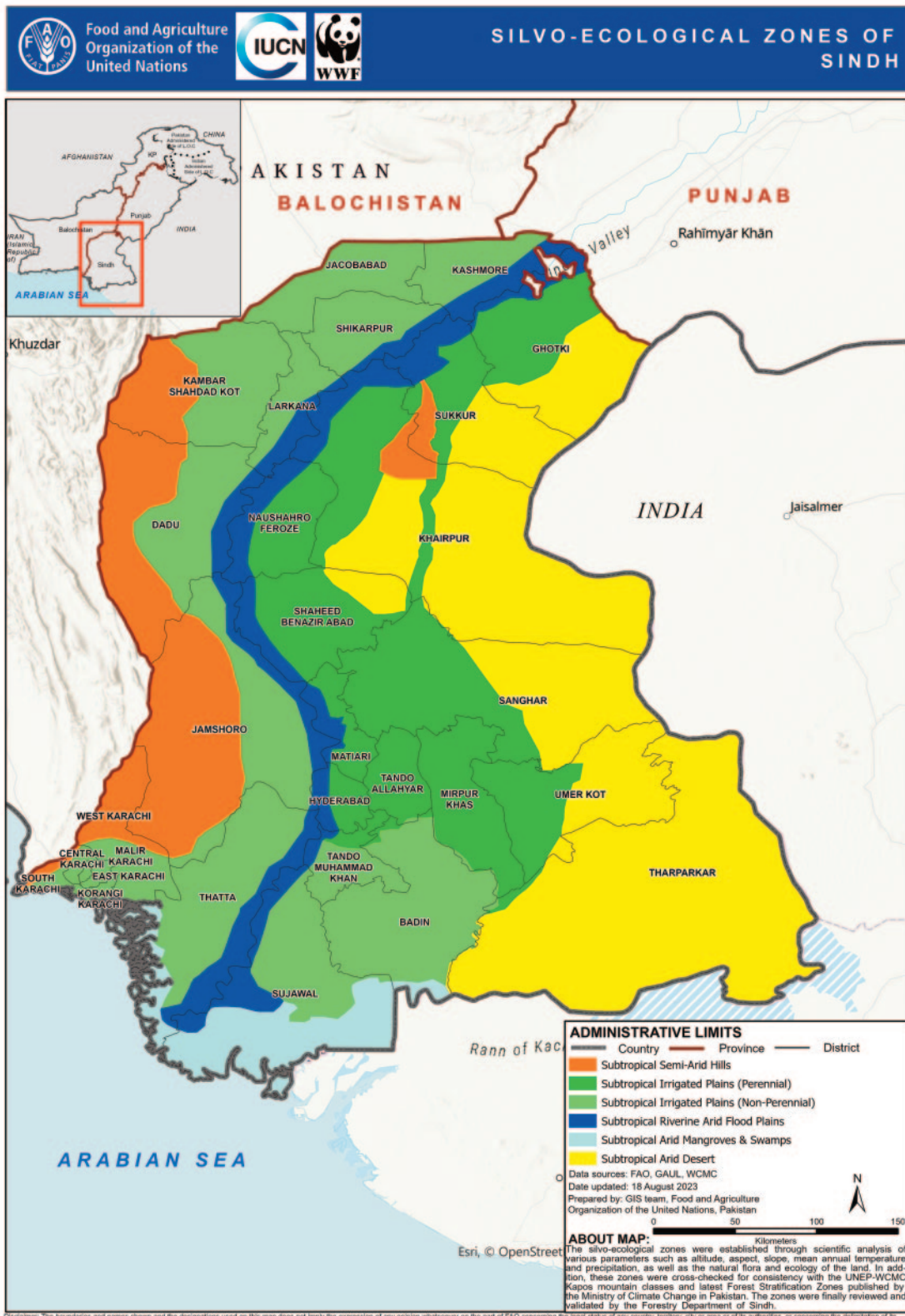
Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Morus alba</i>	Toot	Native
<i>Gmelina arborea</i>	Gumhar	Native
<i>Bombax ceiba</i>	Semul	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Albizia lebbeck</i>	Siris, Shreen	Native
<i>Melia azedarach</i>	Dhrek, Bakain	Native
Subsidiary Species		
<i>Salvadora oleoides</i>	Peelu / Vun	Native
<i>Capparis decidua</i>	Dela, Karir	Native
<i>Gmelia arborea</i>	Gamhar	Exotic
<i>Bischofia javanica</i>	Prota, Bishop Wood	Native
<i>Dalbergia sissoo</i>	Shisham	Native
<i>Terminalia arjuna</i>	Arjun	Native







2.4 Suitable Species for Different Silvo-Ecological Zones in Sindh



1. Subtropical Semi-Arid Hills

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Senegalia senegal</i>	Kikar, Khair	Native
<i>Tecomella undulata</i>	Ticama, Roheero	Native
<i>Commiphora wightii</i>	Guggal, Gugral	Native
<i>Senegalia modesta</i>	Phulai	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Vachellia jacquemontii</i>	Babri, Bouli, Ratabanli	Native
<i>Cordia myxa</i>	Goondi	Native
<i>Cordia dichotoma</i>	Lasura	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Salvadora oleoides</i>	Peelu, Jar, Peroon	Native
<i>Casuarina equisetifolia</i>	Casuriana	Exotic
Subsidiary Species		
<i>Vachellia tortilis</i>	Walaiti Kikar	Exotic
<i>Faidherbia albida</i>	Babur	Exotic
<i>Conocarpus lancifolius</i>	Cono	Exotic
<i>Conocarpus erectus</i>	English Cono	Exotic

2. Subtropical Irrigated Plains (Perennial)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Vachellia nilotica</i>	Babur, Babul, Kikar	Native
<i>Dalbergia sissoo</i>	Tahli, Shisham	Native
Subsidiary Species		
<i>Albizia lebbbeck</i>	Sareehan, Black Siris	Native
<i>Albizia procera</i>	Safed Sareehan, White Siris	Native
<i>Azadirachta indica</i>	Neem	Native
<i>Bombax ceiba</i>	Sambul, Simel	Native
<i>Mangifera indica</i>	Amb, Aam	Native
<i>Syzygium cumini</i>	Jaman	Native
<i>Tamarindus indica</i>	Imli, Gidamri	Native
<i>Terminalia arjuna</i>	Arjun	Native
<i>Ficus religiosa</i>	Pipal	Native
<i>Ficus benghalensis</i>	Barh	Native
<i>Cassia fistula</i>	Aritheo, Amaltas	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Phoenix dactylifera</i>	Khajji	Native
<i>Eucalyptus camaldulensis</i>	Safeda	Exotic
<i>Eucalyptus microtheca</i>	Safeda	Exotic

3. Subtropical Irrigated Plains (Non-Perennial)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Vachellia nilotica</i>	Babur, Babul	Native
<i>Azadirachta indica</i>	Neem	Native
Subsidiary Species		
<i>Terminalia arjuna</i>	Arjun	Native
<i>Phoenix dactylifera</i>	Khaji	Native
<i>Albizia lebbek</i>	Sareehan, Black Siris	Native
<i>Albizia procera</i>	Safed Sareehan, White siris	Native
<i>Tamarindus indica</i>	Imli, Gidamri	Native
<i>Moringa oleifera</i>	Sohanjna	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Eucalyptus camaldulensis</i>	Safeda, Laachi	Exotic
<i>Eucalyptus microtheca</i>	Safeda, Laachi	Exotic
<i>Conocarpus lancifolius</i>	Cono	Exotic
<i>Conocarpus erectus</i>	English Cono	Exotic

4. Subtropical Riverine Arid Flood Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Vachellia nilotica</i>	Babur, Babul, Kikar	Native
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Populus euphratica</i>	Bahn	Native
Subsidiary Species		
<i>Tamarix dioica</i>	Lai	Native
<i>Tamarix aphylla</i>	Lao, Farash	Native
<i>Salvadora oleoides</i>	Peelu, Jar, Peroon, Khabar	Native

5. Subtropical Riverine Arid Flood Plains

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Avicennia marina</i>	Timmar	Native
<i>Rhizophora mucronata</i>	Kumrri	Native
Subsidiary Species		
<i>Ceriops tagal</i>	Kirirri	Native
<i>Ceriops decandra</i> *	Not Known	Extinct
<i>Aegiceras corniculatum</i>	Chaanhr	Native
<i>Bruguiera gymnorhiza</i> *	Not Known	Extinct
<i>Rhizophora apiculata</i> *	Not Known	Extinct
<i>Sonneratia caseolaris</i> *	Not Known	Extinct

*Reported by Syed Mohammed Saifullah, University of Karachi in book: The third Research on Mangroves in Middle East, (pp.69-80). Chapter: Mangrove Ecosystem of Pakistan. Publisher: Japan cooperation Centre for middle east publication No.137, January 1982.

6. Subtropical Arid Desert

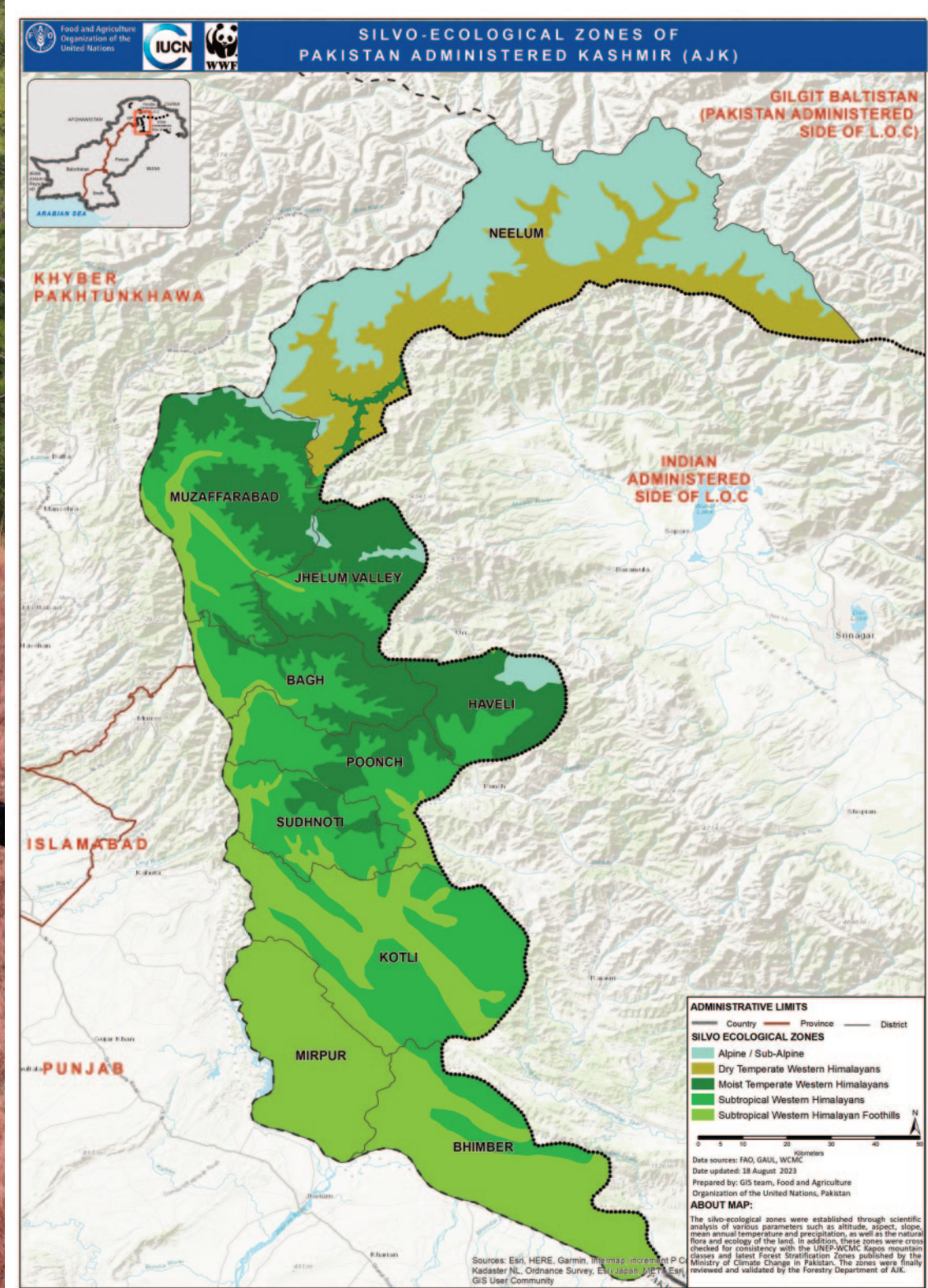
Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Prosopis cineraria</i>	Jand/Kandi	Native
<i>Salvadora oleoides</i>	Peelu, Jar, Peroon	Native
<i>Commiphora wightii</i>	Guggal, Gugral	Native
<i>Vachellia jacquemontii</i>	Babri, Bouli, Ratabanli	Native
<i>Senegalia senegal</i>	Kikar, Khair	Native
<i>Commiphora wightii</i>	Gugal, Gugral	Native
<i>Tamarix aphylla</i>	Farash	Native
<i>Tecomella undulata</i>	Rohirro, Lahura	Native
<i>Azadirachta indica</i>	Nim. Neem	Native
<i>Cordia myxa</i>	Goondi	Native
<i>Cordia dichotoma</i>	Lasura	Native
<i>Ziziphus mauritiana</i>	Ber	Native
<i>Moringa oleifera</i>	Sohanjna	Native
Subsidiary Species		
<i>Vachellia tortilis</i>	Walaiti Kikar, Babur	Exotic
<i>Conocarpus lancifolius</i>	Kono	Exotic
<i>Conocarpus erectus</i>	English Kono	Exotic
<i>Eucalyptus camaldulensis</i>	Safeda, Lachi	Exotic
<i>Eucalyptus microtheca</i>	Safeda, Lachi	Exotic







2.5 Suitable Species for Different Silvo-Ecological Zones in AJK



1. Alpine/subalpine

Note: Sub-alpine zone is an ecologically sensitive area, and the land should not be disturbed for tree planting. The list of species for this zone is only for the purpose of assisted natural regeneration.

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Betula utilis</i>	Birch, Bhoj Pattar, Burz	Native
<i>Juniper Spp.</i>	Juniper, Bhaintheri	Native
<i>Salix spp.</i>	Willow, Beensa	Native

2. Dry Temperate Himalayan Mountain Range

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Cedrus deodara</i>	Deodar, Diar	Native
<i>Pinus wallichiana</i>	Blue Pine, Kail, Biaar, Riaarr	Native
<i>Picea smithiana</i>	Spruce, Kachhal, Paladdar	Native
<i>Abies pindrow</i>	Fir, Chhichhar, Toong, Partal	Native
<i>Quercus semecarpifolia</i>	Oak, Barungi	Native
<i>Quercus ilex</i>	Oak, Choor	Native
<i>Betula utilis</i>	Burz, Bhoj Patar, Birch	Native
Associated Species		
<i>Juglans regia</i>	Akhrot, Khorr, Akhorr	Native
<i>Morus alba</i>	Safed Toot	Native
<i>Aesculus indica</i>	Horse Chestnut, Bankhorr	Native
<i>Pistacia integerrima</i>	Kangarr, Kahkrrah	Native
<i>Fraxinus hookeri</i>	Sum, Shilli	Native
<i>Corylus colurna</i>	Hazal Nut, Urni, Jangli Badaam	Native
<i>Acer cappadocicum</i>	Maple, Tarkanna, Tilpattra	Native
<i>Prunus padus</i>	Kala Kaath, Bird Cherry	Native
<i>Populus ciliata</i>	Bagnoo	Native
<i>Ailanthus altissima</i>	Drewa, Drewi	Exotic
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Exotic
<i>Populus nigra</i>	Poplar, Safeda	Exotic

3. Moist Temperate Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus wallichiana</i>	Kail, Biaar, Riaar	Native
<i>Abies pindrow</i>	Fir, Toong, Chhicchar, Partal	Native
<i>Picea smithiana</i>	Spruce, Kachhal, Pladdar	Native
<i>Taxus wallichiana</i>	Barmi, Thooni	Native
<i>Quercus dilatata</i>	Barungi	Native
<i>Quercus glauca</i>	Banni	Native
Associated Species		
<i>Juglans regia</i>	Akhrot, Khorr, Akhorr	Native
<i>Aesculus indica</i>	Bankhorr	Native
<i>Ailanthus altissima</i>	Drewi, Drewa	Exotic
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Exotic
<i>Ulmus wallichiana</i>	Manu	Native
<i>Pyrus pashia</i>	Batangi	Native
<i>Cornus macrophylla</i>	Kander	Native
<i>Fraxinus xanthoxyloides</i>	Sum	Native
<i>Acer cappadocicum</i>	Tarkanna, Tilpattar	Native
<i>Populus euramericana</i>	Poplar, Safeda	Exotic
<i>Populus ciliate</i>	Bagnoo	Native
<i>Populus alba</i>	Safeda	Native
<i>Celtis australis</i>	Batkarl	Native
<i>Prunus cornuta</i>	Kala Kath	Native
<i>Salix karelinii</i>	Beesa	Native
<i>Fraxinus hookeri</i>	Sum, Shilli	Native
<i>Diospyros lotus</i>	Amlok	Native
<i>Ficus palmata</i>	Phagwara, Anjir	Native

4. Subtropical Western Himalayas

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus roxburghii</i>	Chir Pine, Chir, Chil	Native
<i>Quercus incana</i>	Reen	Native
<i>Quercus glauca</i>	Banni, Brein	Native
Associated Species		
<i>Olea cuspidate</i>	Koh	Native
<i>Senegalia modesta</i>	Plai, Phulai	Native
<i>Dalbergia sissoo</i>	Sissoo, Shisham, Tahli	Native
<i>Grewia optiva</i>	Dhaman	Native
<i>Ailanthus altissima</i>	Drewa, Drewi	Exotic
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Exotic
<i>Morus alba</i>	Toot	Native
<i>Punica granatum</i>	Jungli Anaar, Daroon, Darunna	Native
<i>Melia azedarach</i>	Bakain, Darek	Native
<i>Salix alba</i>	Willow, Beesa	Native
<i>Ulmus wallichiana</i>	Mannu	Native
<i>Eucalyptus</i>	Safeda, Goond	Exotic
<i>Populus euramericana</i>	Poplar, Safeda	Exotic
<i>Acer oblongum</i>	Tarkanna, Tilpattar	Native
<i>Ficus palmata</i>	Phugwara	Native
<i>Ficus auriculata</i>	Dhusi, Tussa	Native
<i>Pyrus pashia</i>	Batangi	Native
<i>Ulmus villosa</i>	Mannu	Native
<i>Salix tetrasperma</i>	Willow, Beesa	Native
<i>Populus alba</i>	Safeda	Native
<i>Rhus succedaneum</i>	Arkhol, Arkharr	Native

5. Subtropical Western Himalayan Foothills

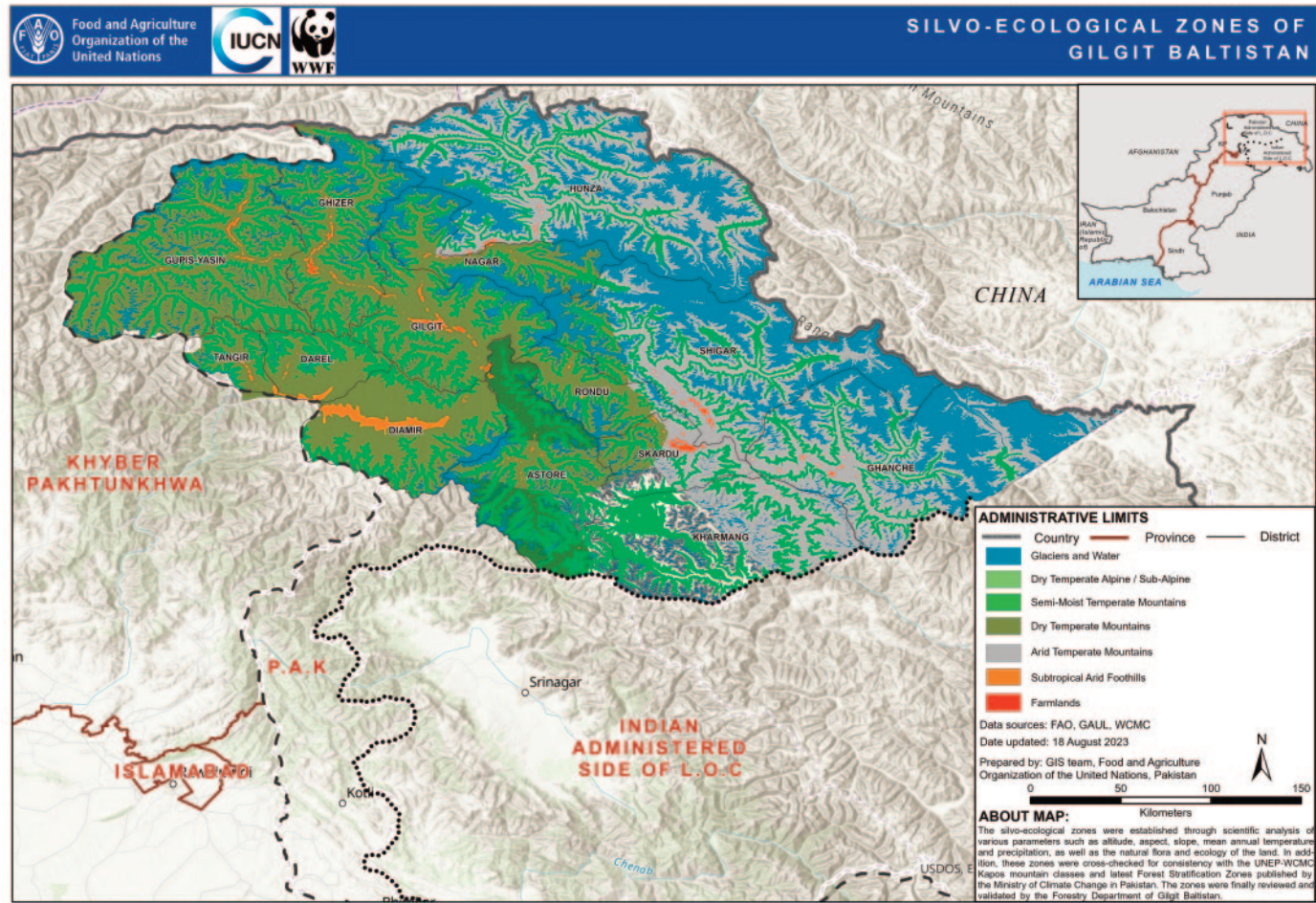
Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Olea Ferruginea</i>	Koh, Wild Olive	Native
<i>Senegalia modesta</i>	Plai, Phulai	Native
<i>Dalbergia sissoo</i>	Tali, Shisham	Native
<i>Acacia catechu</i>	Khair, Katha	Native
<i>Acacia nilotica</i>	Kikar	Native
<i>Pistacia chinensis</i>	Kangarr, Kakrrah	Native
Associated Species		
<i>Albizzia lebeck</i>	Siris, Shreen	Native
<i>Terminalia bellirica</i>	Bahera	Native
<i>Phyllanthus emblica</i>	Amla	Native
<i>Punica granatum</i>	Jangli Anaar, Darunna, Daroon	Native
<i>Bauhinia variegata</i>	Kachnar, Kuliaarr	Native
<i>Cedrela toona</i>	Toon	Native
<i>Cedrela serrata</i>	Drawi	Native
<i>Bombax ceiba</i>	Sumbal, Semul	Native
<i>Casearia tomentosa</i>	Chella	Native
<i>Cassia fistula</i>	Amaltas, Kinjall	Native
<i>Zanthoxylum armatum</i>	Timbur	Native
<i>Butea monosperma</i>	Chechra, Dhak	Native
<i>Celtis australis</i>	Kharik, Batkarl	Native
<i>Alnus nitida</i>	Sharroll	Native
<i>Robinia pseudoacacia</i>	Robinia, Kikar	Exotic
<i>Populus euramericana</i>	Poplar, Safeda	Exotic
<i>Eucllyptus camaldulensis</i>	Safeda, Goond	Exotic
<i>Leucaena leucocephala</i>	Iple Iple	Exotic
<i>Ficus auriculata</i>	Tussa	Native
<i>Ficus carica</i>	Fig, Rumbal	Native
<i>Ficus palmata</i>	Phugwara	Native
<i>Ficus semicordata</i>	Joharphal, Kandrol, Paanjall	Native
<i>Rhamnus triquetra</i>	Girgithan, Gount, Gudlei.	Native
<i>Salix acmophylla</i>	Bed, Beensa	Native
<i>Wendlandia exserta</i>	Ukan, Pansara	Native
<i>Mallotus philippensis</i>	Kamila	Native
<i>Flacourtia indica</i>	Kakoh	Native
<i>Xylosma spp.</i>	Bahtti	Native
<i>Lannea coromandelica</i>	Kamlai	Native
<i>Parkinsonia aculeata</i>	Parkinsonia	Exotic
<i>Engelhardia colebrookia</i>	Samma	Native



© Asim Jamal/IUCN



2.6 Suitable Species for Silvo-Ecological Zones in Gilgit-Baltistan



Disclaimer: The boundaries and names shown and the designations used on this map does not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on map represent approximate border lines for which there may not yet be full agreement. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.



1. Dry Temperate Alpine/Sub-Alpine Zone (3660 – 4570 m)

Note: Sub-alpine zone is an ecologically sensitive area, and the land should not be disturbed for tree planting. The list of species for this zone is only for the purpose of assisted natural regeneration.

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Juniperus excelsa</i>	Chili, Juniper, Chari, Shukpa	Native
<i>Salix denticulate</i>	Beow, Willow, Changma	Native
<i>Betula utilis</i>	Joji, Birch, Staqpa	Native
Subsidiary Species		
<i>Juniperus communis</i>	Chili, Juniper, Chari	Native
<i>Juniperus indica</i>	Chili, Juniper, Chari	Native
<i>Juniperus recurve</i>	Chili, Juniper, Chari	Native
<i>Hippophae rhamnoides</i>	Buro, Sea-buckthorn, Karsoq	Native

2. Semi-Moist Temperate Mountains (120 -3660m)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Picea smithiana</i>	Qachal, Spruce	Native
<i>Pinus wallichiana</i>	Cheer, Blue pine	Native
<i>Populus ciliate</i>	Phulco, Poplar, Ghabiarfa	Native
<i>Abies pindrow</i>	Rai, Partal, Fir	Native
<i>Diospyros lotus</i>	Desi Amlok	Native
Subsidiary Species		
<i>Pistacia khinjuk</i>	Kakaow	Native
<i>Prunus amygdalus</i>	Jungli Badam	Native
<i>Juglans regia</i>	Achoi, Starga	Native
<i>Fraxinus hookeri</i>	Sum,	Native
<i>Fraxinus xanthoxyloides</i>	Ash, Kasunar	Native
<i>Morus alba</i>	Kini Maroch	Native
<i>Platanus orientalis</i>	Chinar	Native
<i>Sorbus tianschanica</i>	Bezar	Exotic
<i>Salix sericocarpa</i>	Juan Guo Liu	Native
<i>Salix babylonica</i>	Mori Bayo	Native
<i>Styphnolobium japonicum</i>	Huai	Exotic

3. Dry Temperate Mountains (120 -3660m)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Pinus wallichiana</i>	Chee, Blue Pine, Thangshing	Native
<i>Cedrus deodara</i>	Diar, Thulaish, Deodar	Native
<i>Pinus gerardiana</i>	Junj, Phulush, Chilghoza	Native
<i>Abies pindrow</i>	Rai, Partal, Fir	Native
<i>Picea smithiana</i>	Qachal, Spruce	Native
<i>Quercus baloot</i>	Bani, Oak	Native
<i>Juniperus pseudosabina</i>	Chili	Native
Subsidiary Species		
<i>Picea smithiana</i>	Qachal, Spruce	Native
<i>Taxus baccata</i>	Barmi	Native
<i>Juglans regia</i>	Acchoul	Native
<i>Fraxinus xanthoxyloides</i>	Kasoner	Native
<i>Quercus ilex</i>	Bani	Native
<i>Morus alba</i>	Maaroch	Native
<i>Platanus orientalis</i>	Buch	Native
<i>Sorbus lanata</i>	Kaship	Native
<i>Sorbus tianschanica</i>	Bezar	Exotic
<i>Salix babylonica</i>	Machoor	Native
<i>Salix iliensis</i>	Chiti Bayo	Native
<i>Malus domestica</i>	Chorky Paloi	Exotic
<i>Prunus cerasoides</i>	Jangly Glas	Native
<i>Prunus avium</i>	Gilas, Wild Cherry	Exotic
<i>Prunus dulcis</i>	Jungle Badam,	Native

4. Subtropical Arid Foothills (910-1220 m)

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Olea ferruginea</i>	Kao	Native
<i>Senegalia modesta</i>	Kikar	Native
<i>Monothecha buxifolia</i>	Gurgura, Gwargurah, Gargol	Native
Subsidiary Species		
<i>Mallotus philippinensis</i>	Kamala, Kumkum Tree	Native
<i>Euonymus hamiltonianus</i>	Dedul, Dharua, Siki, Singi, Naga	Native
<i>Corylus colurna</i>	Greicho, Urni	Native
<i>Crataegus songarica</i>	Shont	Native
<i>Ficus palmata</i>	Faak	Native
<i>Morus alba</i>	Maaroch	Native
<i>Pistacia khinjuk</i>	Kakaow	Native
<i>Punica granatum</i>	Danu, Annar	Native
<i>Tamarix arceuthoides</i>	Hukur	Native
<i>Platanus orientalis</i>	Buch	Native
<i>Ailanthus altissima</i>	Ranthus	Exotic
<i>Robinia pseudoacacia</i>	Kikar	Exotic
<i>Fraxinus xanthoxyloides</i>	Ash, Kasunar	

5. Farmlands

Scientific Name	Local Name	Indigenous/Exotic
Main Species		
<i>Populus alba</i>	Fuch, Ghabiarfa	Naturalized
<i>Populus nigra</i>	Kino Phalcho, Kaqbiar	Naturalized
<i>Ailanthus altissima</i>	Ranthus	Naturalized
<i>Robinia pseudoacacia</i>	Kikar	Naturalized
<i>Elaeagnus hortensis</i>	Gunar, Sarsing	Native
Subsidiary Species		
<i>Juglans regia</i>	Acchoui, Starga	Native
<i>Salix alba</i>	Beow, Hlchangina	Native
<i>Salix babylonica</i>	Mori bayo	Native
<i>Morus alba</i>		Maaroach, Osay
Native		
<i>Prunus cerasoides</i>	Jangly Glas	Native
<i>Prunus avium</i>	Gilas, Cherry	Native
<i>Prunus armeniaca</i>	Juie, Chuli, Apricot	Native
<i>Dalbergia sissoo</i>	Shisham	Native







3. Annexes

Annex 1. List of Suitable Trees for Urban Landscaping

1. Large Trees (height >15m)

These trees are suitable for parks, and large compound and urban plantations or woods. Large Trees are designated as those attaining a height of 15 m or more with a mature spread of 10 m or more. Large trees should be spaced at least 8-10 m apart and should be planted 1.0-1.5 m away from any concrete curb, sidewalk, or patio. The soil must be a minimum of 1 m in depth. These trees require adequate space for canopy growth and should not be planted underneath power lines or within ten (10) feet of streetlights or utility curb boxes. Column trees are tall and very thin, with upright branches. Their vertical shape adds height and provides great screening without taking up much room in the landscape. These are suitable for narrow spaces, privacy when planted close together, and along walkways. Palms are mainly planted for their aesthetic value along driveways, edges of lawns, along boundary walls, etc.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Alstonia scholaris</i>	Chattian	Evergreen, up to 40 m tall, branches and leaves in whorls, green to white fragrant flowers bloom in October.	Central Punjab Foothills
<i>Araucaria heterophylla</i>	Araucaria	Evergreen tree, height of 50–65 m tall, straight vertical trunk and symmetrical branches.	Irrigated plains Hilly areas where frost does not occur
<i>Azadirachta indica</i>	Neem	Evergreen tree, up to 25 m tall, white fragrant flowers are small, bunches of flowers in March and April, planted for shade.	tropical and Subtropical frost-free regions.
<i>Bischofia javanica</i>	Bishop Tree	Large evergreen tree, 15-17 m tall, planted in parks and as avenue tree.	Irrigated plains and frost-free regions.
<i>Bombax ceiba</i>	Simel	Large deciduous tree, 36 m or more tall, red showy flowers are fleshy and occur in March.	Himalayan foothills and cultivated throughout the plains as an avenue tree.
<i>Cassia nodosa</i>	Java Cassia	Fast growing, deciduous / semi-deciduous tree which flowers in spring. It has a straight trunk that reaches heights of 25 - 40m.	
<i>Cedrus deodara</i>	Diar	It is a large evergreen coniferous tree reaching 40–50 m tall with a trunk up to 3 m n diameter. It has a conic crown with level branches and drooping branchlets.	
<i>Celtis eriocarpa</i>	Batkarl	Deciduous tree, 15-18 m tall, with slender pendulous branches, leaves turn pale yellow in fall, drought tolerant and tolerates urban pollution.	Moist temperate zone, cultivated in uplands.
<i>Corylus colurna</i>	Urni	Deciduous tree, up to 25 m tall, conical crown spreading in mature trees, flowers on male plants bloom in early spring before the leaves. Very tolerant of difficult growing conditions in urban areas.	Moist temperate Himalayan range
<i>Cupressus arizonica</i>	Devi Dayar	Tree up to 25 m high crown broadly conical;	Dry Temperate Highlands,

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Cupressus sempervirens</i>	Saru	Medium-sized coniferous evergreen tree to 35 m (with a conical crown).	Dry Temperate Highlands,
<i>Erythrina suberosa</i>	Gul-i-Nishter	Showy flowers and habit of flowering most of the year, it is often planted as an ornamental or street tree.	Irrigated Plains
<i>Eucalyptus citriodora</i>	Sufeda	Tall tree that is endemic to north-eastern Australia. It has smooth white to pink bark, narrow lance-shaped to curved adult leaves, flower buds in groups of three, white flowers and urn-shaped or barrel-shaped fruit	Irrigated plains
<i>Ficus benghalensis</i>	Burr, Bohrr	Large evergreen tree, sheds leave for a short period in hot season, large spreading crown.	Sub-Himalayan tract
<i>Ficus microcarpa</i>	Indian Laurel	Evergreen, up to 15-20 m tall, dense rounded crown, commonly planted as a street tree	Irrigated plains
<i>Ficus racemosa</i>	Gular	Evergreen or occasionally deciduous tree 10-20 m tall, planted for shade in gardens.	Irrigated plains
<i>Ficus religiosa</i>	Pipal	Large evergreen tree, sheds leaves for a short period in hot season, large spreading crown. Planted in gardens and as avenue tree for shade.	Sub-Himalayan tract and irrigated plains
<i>Ficus virens</i>	Pilkan	A large-sized tree 24–27 m high. It has two marked growth periods: in spring (February to early May), and in the time of the monsoon rains (i.e., June to early September). The new leaves are a beautiful shade of reddish pink and very pleasing to the eye. This is a very massive tree in which the size of the crown can sometimes exceed the height of the tree.	Tropical and subtropical regions.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Millingtonia hortensis</i>	Tree Jasmine	A tall erect evergreen tree attaining a height of 18-25 m, white fragrant flowers in February and March, ornamental trees in parks and large compounds. Not common in Pakistan, planted only in some rest houses.	Subtropical irrigated plains.
<i>Millettia pinnata</i>	Sukh Chain	Semi-evergreen tree with drooping branches, grows to about 15–25 m with a large canopy that spreads equally wide, clusters of small white, purple, and pink flowers in March and April.	Cultivated in Subtropical zone up to 600 m elevation, irrigated plains and foothills.
<i>Monoon longifolium</i>	False Ashoka Ulta Ashok	Evergreen trees grow to over 20 m. in height, symmetrical pyramidal growth with willowy weeping pendulous branches and long narrow lanceolate leaves. Commonly planted due to its effectiveness in alleviating noise pollution.	Subtropical zone and irrigated plains.
<i>Neolamarckia cadamba</i>	Kadam	Ornamental, large evergreen tropical tree up to 45 m, broad umbrella-shaped crown. It has a straight, cylindrical bole, sometimes with buttresses, often planted as avenue tree for shade.	Humid sub-tropics.
<i>Platanus orientalis</i>	Chinar	A large, deciduous tree 20 to 25 m tall, spreading crown, the leaves change to blood red, amber or yellow in fall.	Temperate zone but has also cultivated in Islamabad and Lahore.
<i>Prunus cornuta</i>	Kala Kath	Deciduous, large tree, 15-18 m tall with a similar spread, the white flowers grow in 10 to 15 cm long bunches.	Dry Temperate Zone
<i>Pterospermum acerifolium</i>	Kanak Champa	Evergreen tree with an irregular crown, up to 30 m in height, planted as a roadside tree or garden ornamental valued especially for its beautiful, fragrant blooms.	Subtropical plains.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Roystonea regia</i>	Royal Palm	A large and attractive palm, planted as an ornamental tree. reaches heights to 25 m, trunk is stout, very smooth and greyish white in color with a bulge below a distinctive green crown, about 15 leaves which can be up to 4 m long	Subtropical zone
<i>Terminalia arjuna</i>	Arjun	Evergreen tree attaining a height of 20–30 m, forms a wide canopy at the crown, cultivated as roadside tree.	Arid irrigated plains Irrigated plains. Subtropical foothills also
<i>Terminalia catappa</i>	Jangli Badam	Deciduous trees, up to 35 m tall, mainly planted for shade. perennial	Tropical and subtropical zones.
<i>Toona sinensis</i>	Toon Chinese Mahogany	Deciduous tree up to 20 m tall. Masses of pinkish white tubular flowers appear in May-June. Cultivated as avenue tree.	Moist shady places from 1000 m to 2500 m

2. Medium Trees (Height 7-15 m)

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Aegle marmelos</i>	Bael	Deciduous tree, up to 13 m tall, drooping branches and rather open, irregular crown. Cultivated in parks.	Sub-Himalayan tract, from Jhelum eastward, Salt Range and lower Balochistan,
<i>Amherstia nobilis</i>	Pride of Burma	Evergreen tree grows up to 15 m tall, rounded crown, gentle weeping branches. It produces large, showy crimson flowers hanging in bunches.	Humid Subtropical area.
<i>Butea monosperma</i>	Chechra, Dhak	Medium-sized dry-season deciduous tree, crooked trunk, and irregular branches, growing to 15 m tall, flowers are bright orange-red and produced in bunches.	Sub-Himalayan tract
<i>Brachychiton populneus</i>	Kurrajong	Medium sized trees can reach up to 15 m, dense canopy of glossy green foliage, the cream-colored flowers with streaked pink or purple throats, appear late spring to autumn, great source of nectar for bees. Highly drought tolerant.	Subtropical zone
<i>Cassia fistula</i>	Amaltas	A medium-sized deciduous tree, growing to 10–20 m tall with fast growth. The flowers are produced in pendulous racemes 20–40 cm long with yellow petals. The tree has strong and very durable wood for making furniture, agricultural implements, wheels and mortars.	Sub-Himalayan tract and sub-tropics. Irrigated plains
<i>Cedrela toona</i>	Toon	Deciduous tree, crown broad and rounded, sweet scented white flowers in March-May.	Plains and foothills up to 1000 m.
<i>Celtis caucasica</i>	Batkhar	Deciduous tree with rounded crown, about 15 m tall with slender pendulous branches, leaves turn pale yellow in fall, drought tolerant and tolerates urban pollution.	Temperate zone in Pakistan.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Citharexylum spinosum</i>	Fiddle Tree	A fast-growing evergreen tree up to 15 m tall, small white flowers are produced throughout the year on hanging axillary and terminal racemes and panicles 20–40 cm in length.	Tropical and subtropical zones
<i>Cornus macrophylla</i>	Kandara	Deciduous trees growing to 15 m, creamy white flowers borne in bunches.	Moist temperate Himalayan region
<i>Crateva religiosa</i>	Religious Tree	Semi-evergreen, spreading crown, glossy foliage. Cultivated in temples and graveyards.	Sub-Himalayan tract and irrigated plains.
<i>Cupressus sempervirens</i>	Saru	Medium-sized coniferous evergreen tree to 35 m (with a conic crown)	Dry Temperate Highlands,
<i>Diospyros malabarica</i>	Gaab	Almost evergreen tree, leafless only for short time, new leaves shining coppery red, spreading crown. Large red velvety fruits. Planted as avenue tree.	Irrigated plains and plateau
<i>Delonix regia</i>	Gul Mohar	Semi-evergreen tree that attains heights of 12 to 15 m with diameters, bright showy scarlet flowers in bunches appear in May and June.	Southern Sindh
<i>Ehretia serrata</i>	Puna	Medium sized tree, up to 12 m tall, oblong in shape, small white flowers are fragrant, occur in large cone shaped bunches	Sub-Himalayan tract and central Punjab.
<i>Fernandoa adenophylla</i>	Nag Phalli	Deciduous tree up to 15 m tall, large leaves, large pale yellow trumpet shaped flowers, fruit long and twisted, hanging like snakes.	Irrigated plains
<i>Hyophorbe lagenicaulis</i>	Bottle Palm	A small evergreen palm, growing to 7m tall, smooth pale grey to almost white trunk with swollen like a bottle, 4-8dark gracefully arching green feather like leaves at the top of the trunk	Subtropical zone

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Livistona chinensis</i>	Fountain Palm	Medium sized evergreen palm adorned with up to 50 large emerald-green leaves	Subtropical zone
<i>Mallotus philippensis</i>	Kamila	Semi-evergreen tree growing to 12 m high, it is grown as an ornamental, being valued especially for its red fruits.	Subtropical Himalayas region
<i>Melia azedarach</i>	Dharek	Deciduous tree with a rounded crown, grows up to 12 m, purple or lilac flowers in clusters. Mainly planted for shade and flowers.	Himalayas up to 1700 m, cultivated in subtropics and irrigated plains.
<i>Mimusops elengi</i>	Molsery	Medium-sized evergreen tree, up to 16 m tall, dense shade flowers are cream, hairy, and scented, fruits are fleshy, range in color	Subtropical and irrigated plains.
<i>Putranjiva roxburghii</i>	Patajin	Evergreen deciduous tree, growing up to 15 m, with pendent branches. Ornamental tree planted for shade.	Subtropical plains Irrigated plains
<i>Salix babylonica</i>	Weeping Willow	Deciduous tree up to 12 m high with a graceful and refined, open crown of ground-sweeping branches.	This willow grows especially well near water.
<i>Saraca asoca</i>	Ashoka	Evergreen tree growing to 9 m, prized for its beautiful foliage and bunches of fragrant flowers in February to April.	Subtropical zone and irrigated plains.
<i>Schinus molle</i>	Kali Mirch	Evergreen tree that grows to 15 meters tall and wide, upper branches of the tree tend to droop, foliage bright green and comprised of many narrow leaflets, flowers are insignificant but the papery pink to red berries are wonderfully ornamental in the fall and winter.	Cultivated in subtropics. Irrigated plains

3. Small Trees

Small Trees are designated as those attaining a height of less than 10 meters with a mature spread of three meters or more. Small trees are appropriate for planting under overhead wires and utilities and can be planted less than eight meters apart.

Small trees are suitable for planting along roads with narrow side strips of land on sides, under electric lines, among streetlights, in homes for shade or flowers, large compounds parks etc.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Bauhinia purpurea</i>	Koiral Qarmazi Kachnar	Medium-size deciduous tree growing to 5 m tall, conspicuous pink fragrant flowers appear September-November, planted as an ornamental roadside and garden plant.	Himalayan foothills and cultivated in Subtropical zone.
<i>Bauhinia variegata</i>	Kachnar	Deciduous in the dry season 10–12 m tall, conspicuous bright pink or white flowers appear in February-April, widely planted as an ornamental tree.	Sub-Himalayan tracts. It has a wide distribution through the hills and plains
<i>Cassia javanica</i>	Java Cassia	Small tree with spreading crown. garden tree owing to its beautiful crimson and pink flower bunches	Subtropical areas.
<i>Ceratonia siliqua</i>	Carob Tree	Flowering evergreen tree or shrub. It is widely cultivated for its edible pods, and as an ornamental tree in gardens.	Mediterranean region and irrigated plains.
<i>Cochlospermum gossypium</i>	Galgal	It is a small tree growing to a height of 7.5 m, yellow and bright flowers, planted along roadside parks and gardens	Subtropical areas
<i>Dillenia indica</i>	Elephant Apple	It is an evergreen tree growing to 15 m tall, grown in gardens, where it is highly prized for its large (15–20 cm) handsome white flowers with yellow stamens and fragrant large flowers.	Subtropical areas
<i>Ehretia laevis</i>	Sakkar	A small to medium sized tree up to 9 m tall. Flowers white.	Subtropical foothills

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Flueggea virosa</i>	Path Geri	Deciduous shrub or small tree, up to 4 m high; numerous branches arising from the base and spirally arranged upwards, small creamy green flowers, fruit are white and fleshy and appear in December-March.	Subtropical areas.
<i>Guaiacum officinale</i>	Lignum	A small (7-10 m in height) with a round crown, slow-growing trees, attractive blue flower and orange-yellow fruit.	Coastal areas.
<i>Jatropha integerrima</i>	Jatropga	Evergreen woody shrub or small tree, able to grow up to about 4.5 m tall and with a spread of 2 - 3 m wide, clusters of flowers.	Cultivated in subtropics and irrigated plains.
<i>Lagerstroemia indica</i>	Lagerstroemia	Deciduous multi-stemmed tree, a wide spreading crown, up to 7 m tall, flowers are white, pink, mauve, purple or carmine with crimped petals.	Temperate, Subtropical areas and irrigated plains.
<i>Melaleuca viminalis</i>	Weeping Bottle Brush	Evergreen multi-trunked tree, pendulous foliage, and large numbers of bright red bottlebrush flowers in spring and summer. It grows up to 10 m tall.	Subtropical zone.
<i>Melia azedarach</i>	Bakain, Chhatri Dhrek	This is a variety of <i>Melia azedarach</i> (Dhrek) which has multiple stems, It is a small to medium tree, with dense canopy.	Cultivated in Subtropical plains. Irrigated plains.
<i>Nyctanthes arbor-tristis</i>	Harsingar	Shrub or a small tree growing to 10 m, clusters of fragrant flowers with an orange-red center; they are produced in two to seven together, with individual flowers opening at dusk and casting off in the morning thus making a carpet of flowers.	Cultivated in subtropics. Irrigated plain Foothills also
<i>Oroxylum indicum</i>	Trumpet Flower	Deciduous trees up to 10 m in height, leaves very large, night-bloomer, enormous seed pods up to 1.5 m long that hang down from bare branches, resembling swords.	Cultivated from foot hills to Subtropical plains.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Peltophorum pterocarpum</i>	Golden Shower	A small sized tree, up to 10 m high, dense green crown, bunches of yellow flowers May-August,	Subtropical zone mainly southern Pakistan.
<i>Pistacia chinensis</i> ssp. <i>Integerrima</i>	Kakar-Singhi	Deciduous trees up to 17 m or taller. This species is planted as a street tree in temperate areas worldwide due to its attractive fruit and autumn foliage	Temperate zone
<i>Prunus persica</i>	Aroo	A deciduous tree growing to 6 m, pink-red flowers arrive in very early spring. A fruit tree but cultivated in plains as an ornamental tree.	Mediterranean climate, cultivated in plains as an ornamental tree.
<i>Tecomella undulata</i>	Lahura, Rohirro	A small semievergreen tree, up to 5 m tall, in springtime it produces beautiful showy tubular flowers in yellow, orange and red colors	Subtropical uplands and some desert areas.
<i>Thespesia populnea</i>	Portia	Evergreen tree reaches a height of 6–10 m, canopy 3-4 m wide, cup-shaped flowers are pale 5 to 8 cm, produced intermittently throughout the year.	Coastal areas.
<i>Triadica sebifera</i>	Tarcharbi	A deciduous tree, rounded crown, growing to 9 m, leaves become bright yellow, orange, purple and red in the autumn, planted for shade. It is highly adaptable and will grow in a wide range of conditions.	Temperate zone

4. Shrubs

Shrubs are suitable for medians in urban roads, under telephone lines, or as a first row where two or more rows can be planted along urban roads, parks, along driveways, edges of lawns, etc. The flowering shrubs are generally planted for aesthetics in homes, parks and along roads.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Bougainvillea sp.</i> ,	Boganvilla	A woody vine or shrub, reaching 12 m, flowers are small, white, and inconspicuous, highlighted by several brightly colored modified leaves called bracts.	Subtropical areas and irrigated plains.
<i>Caesalpinia pulcherrima</i>	Poinciana	A shrub growing to 3 m tall, semievergreen, yellow, orange, or red flowers are borne in bunches, frost tender.	Sothern Sindh
<i>Melaleuca citrina</i>	Red Bottle Brush	It is a shrub growing to 5 m tall. Its showy red flower spikes, present over most of the year in an ideal situation, account for its popularity.	Subtropical zone
<i>Murraya paniculata</i>	Kamni, Marwa	A shrub 3-4 m tall, flowers have the scent of orange blossoms and arranged in loose groups, small red fruits at the same time.	Subtropical areas and irrigated plains.
<i>Nerium oleander</i>	Kaner, Kaneer	Shrub 2–6 m tall. with multiple stems spreading outward as they mature; white, pink to red flowers grow in clusters year-round at the end of each branch, grow in clusters, peaking during the summer. It is tolerant to both drought and inundation but not to prolonged frost, cultivated as an ornamental and landscaping plant	Subtropical areas and irrigated plains,
<i>Platycladus orientalis</i>	Mor Punkh	A small, slow growing shrub grows as a dense, conical shrub. The foliage forms in flat sprays with scale-like leaves which are bright green in color. The branches are relatively short, loosely arranged and, usually, sharply directed upwards.	Temperate areas.

Species	Local Names	Landscape Characterization	Suitable Habitat
<i>Punica granatum</i>	Anaar, Annar Danna	A fruit-bearing deciduous shrub that grows between 5 and 10 m tall. The flowers are red.	Subtropical Mountain Zone, temperate areas.
<i>Rhododendron arboretum</i>	Burans; Burus; Chalan; Chiu; Zalatai.	It is an evergreen shrub with a showy display of bright red flowers	Temperate region
<i>Tecoma stans</i>	Tecoma Kaneru, Yellow Oleander	It is an irregularly shaped, evergreen shrub, generally 2-3 m tall, has several stems clusters of large, trumpet-shaped, yellow flowers are very showy against the olive-green leaves.	Subtropical areas
<i>Thevetia neriifolia</i>		Large ornamental shrub, poisonous but of very high landscape value because of its hardiness, showy yellow flowers in clusters.	Subtropical zone

Annex 2. Tree Species Suitable for Bird Food and Pollinators

Scientific Name	Local Name	Native/Exotic	Fruit/Nectar
<i>Albizia lebbbeck</i>	Black Siris	Native	Nectar
<i>Albizia procera</i>	Safed Siris	Native	Nectar
<i>Bauhinia purpurea</i>	Kachnar	Native	Nectar
<i>Bauhinia variegata</i>	Bahari	Native	Nectar
<i>Bombax ceiba</i>	Simel	Native	Nectar
<i>Adhatoda vasica</i>	Bhekarr	Native	Nectar
<i>Capparis decidua</i>	Karir, Dela	Native	Fruit
<i>Carissa opaca</i>	Garanda	Native	Fruit / Nectar
<i>Cordia dichotoma</i>	Lasura	Native	Fruit
<i>Cordia myxa</i>	Goondi	Native	Fruit
<i>Crateva religiosa</i>	Religious Tree Karonda	Native	Nectar
<i>Ficus benghalensis</i>	Bar	Native	Fruit
<i>Ficus carica</i>	Fig	Native	Fruit
<i>Ficus racemosa</i>	Gular	Native	Fruit
<i>Ficus religiosa</i>	Pipal	Native	Fruit
<i>Ficus virens</i>	Pilkhan	Native	Fruit
<i>Morus alba</i>	Mulberry	Native	Fruit
<i>Morus nigra</i>	Mulberry	Native	Fruit
<i>Phoenix dactylifera</i>	Khajur	Native	Fruit
<i>Prosopis cineraria</i>	Jand/Kandi	Native	Nectar
<i>Punica granatum</i>	Anar Danna	Native	Fruit
<i>Putranjiva roxburghii</i>	Patajin	Native	Fruit
<i>Salvadora oleoides</i>	Peelu	Native	Fruit
<i>Salvadora persica</i>	Peelu	Native	Fruit
<i>Senegalia modesta</i>	Phulai	Native	Nectar
<i>Syzygium cumini</i>	Jaman	Native	Nectar / fruit
<i>Ziziphus mauritiana</i>	Ber	Native	Fruit / Nectar
<i>Melaleuca viminalis</i>	Bottle brush	Exotic	Nectar
<i>Elaeagnus angustifolia</i>	Russian Olive	Native	Nectar / fruit
<i>Eucalyptus microtheca</i>	Sufeda	Exotic	Nectar
<i>Eucalyptus tereticornis</i>	Sufeda	Exotic	Nectar
<i>Ficus retusa</i>	Bobari	Exotic	Fruit
<i>Gleditsia triacanthos</i>	Honey Locust	Exotic	Nectar
<i>Gmelina arborea</i>	Gumhar	Exotic	Nectar
<i>Grevillea robusta</i>	Silver Oak	Exotic	Nectar
<i>Plectranthus rugosus</i>	Peemaar	Native	Nectar
<i>Robinia pseudoacacia</i>	Black Locust	Exotic	Nectar
<i>Sapium sebiferum</i>	Tarcharbi, Charbi	Exotic	Nectar
<i>Senegalia modesta</i>	Phulai	Native	Nectar
<i>Tamarindus indica</i>	Imli	Exotic	Nectar
<i>Vitex negundo</i>	Marwanii, Banna, Asl-e-Ameer	Native	Nectar

Annex 3. Tree Species Suitable for Saline and Waterlogged Soils

The following is a list of species that can grow in various levels of saline and waterlogged soils.

Scientific Name	Local Name	Native/Exotic	Salinity Tolerance
<i>Albizia lebbbeck</i>	Black Siris	Native	Low
<i>Azadirachta indica</i>	Neem	Native	Low
<i>Millettia pinnata</i>	Sukh Chain	Native	Medium
<i>Prosopis cineraria</i>	Jand/Kandi	Native	Low
<i>Salix tetrasperma</i>	Indian Willow	Native	Low
<i>Salvadora oleoides</i>	Peelu	Native	High
<i>Salvadora persica</i>	Peelu	Native	High
<i>Syzygium cumini</i>	Jaman	Native	Medium
<i>Tamarix aphylla</i>	Farash	Native	High
<i>Terminalia arjuna</i>	Arjun	Native	Low
<i>Vachellia nilotica</i>	Babul	Native	High
<i>Ziziphus mauritiana</i>	Ber	Native	Low
<i>Casuarina equisetifolia</i>	Casuarina	Exotic	Medium
<i>Eucalyptus camaldulensis</i>	Sufeda	Exotic	Medium
<i>Eucalyptus citriodora</i>	Sufeda	Exotic	Low
<i>Eucalyptus microtheca</i>	Sufeda	Exotic	Low
<i>Eucalyptus tereticornis</i>	Sufeda	Exotic	Low
<i>Faidherbia albida</i>		Exotic	Medium

REFERENCES

- Ch. Ahmed Din 1993. Working Plan for the Forests of Bagh and Rawalakot Forest Divisions.
- FAO. 2012. Global ecological zones for FAO forest reporting:2010 Update. Forest Resources Assessment Working Paper 179. Food and Agriculture Organizations of the United Nations. Rome. 52. pp.
- Kilongosi, C.; Kadenyi; N., Bosma, L.; Steenbergen, F.; Kioko, T.; Messo, J.; Kidake, B.; and Kigwa, B. 2015. Roadside Tree Planting Manual. World Agroforestry, Kenya Forestry Research Institute. 35pp.
- Lillesø, J.P.B., Dhakal, L.P., Shrestha, T.B., Nayaju, R.P., Shrestha, R. and Kjaer, E.D. 2001. Tree Planting Zones in Nepal - an ecological approach based on vegetation types. DFSC Case Study No.1. TISC Technical Paper No. 103. Danida Forest Centre, Humlebæk. Tree Improvement and Silviculture Component, Kathmandu
- Mumtaz Akhtar Qadir 1994, Revised Management Plan for the Forests of Muzaffarabad Forest Division.
- Punjab Forest Department. Forest and Environment Species. Publicity and Extension Division, Punjab Forest Department, Lahore. 156 pp.
- Qureshi, Abdur Rauf 1990, Revised Forest Management Plan for the Forests of Neelum Valley, Keran and Sharda Forest Divisions.
- Saifullah, S.M. 1982. Mangrove Ecosystems of Pakistan, pp 69-80. The Third Research on Mangroves in Middle East. Publication No. 137, Japanese Corporation Research Centre, Tokyo, Japan.
- Shabir, A., Singh, N., Barea, F., and Khan, R. 2020. Tree Flora of Botanical Garden and Punjab University Lahore. *Biologia*, Lahore, Pakistan. 66(1):99-124.
- Sheikh, M. I. 1962. West Pakistan Forest Department Records No 8. (English) – Tips on Avenue Planting in West Pakistan. Government Printing & Stationery, West Pakistan, Peshawar.
- Sheikh, M. I. 1992. Suitable Tree Species for Different Agro-ecological Zones and Civil Divisions of Pakistan. Technical Note No. 11, Winrock International, Islamabad, Pakistan. 24 pp
- Sheikh, M. I. 1993. Species Recommended for Different Edaphic and Climatic Sites and Methods of Planting. Foresters Field Guide No. 2. Winrock International, Islamabad, Pakistan. 24 pp.
- Sheikh, M. I. 1993. Trees of Pakistan. Winrock International, Islamabad, Pakistan. 142 pp



Project Management Unit

3rd Party M&E Consortium of IUCN,
FAO & WWF

70-A, Main Nazim-ud-din Road,
F-7/4, Islamabad

Tel +92 (51) 2656991-97

Cell : +92 (300) 0569164

