

Report on the situation of Tree Care in the city of Tbilisi, Georgia on the basis of the urban plane-tree population



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1. Introduction

In the Georgian capital of Tbilisi, the improper pruning of the urban plane tree population led to protests in recent years, that fell back on the Ministry of Environment and Natural Resource Protection.

In March 2013, the Minister of Environment of Georgia, Mrs. Khatuna Gogaladze accompanied by a delegation of members of parliament made a trip to Germany where among other things, she examined the way trees are being pruned in German cities like Wiesbaden.

The Minister has asked the Gesellschaft für internationale Zusammenarbeit (GIZ, Society for International Cooperation) for assistance in revising the Tree Care Plan of the city of Tbilisi and the training of municipal arborists as part of the Sustainable Management of Biodiversity, South Caucasus (SMBP) programme.

Between July 15 and July 19, 2013 Detlef Koch (European Tree Technician in Germany) visited Tbilisi to gain an overview on the situation of the trees and the Tree Care that is being practiced in the city. In the following report, the impressions gained on the trip are explained in detail.

2. General description of the condition of the urban plane trees

The townscape of the Georgian capital of Tbilisi includes extensive parks and avenues. Whereas the streets are lined mostly with plane trees (*Platanus*), the park areas consist of a diverse tree population. Dominating species are cedars (*Cedrus*) and pines (*Pinus*). Along the river banks poplars (*Populus*) and willows (*Salix*) are growing.

2.1 Age of the trees

The observations were focussed on the urban plane trees. Most of the trees are aged between 20 and 70 years. The age of some plane trees in parks and public spaces significantly exceeds 70 years. The city's tree cadastre introduced in the 1980's and kept until about 1990 gives insight into the age of the trees.

2.2 Assessment of the crowns

Many trees in the city of Tbilisi have been heavily pruned in recent years. One frequently encounters trees with their main branches (branches with a diameter > 10 cm) sawn off. The pruning measures do not reflect the current state of scientific and technical knowledge in arboriculture. They are done according to the needs of the environment (distance to houses, road signs, billboards, lighting, etc.) and what is

technically possible (radius of action of the areal work platform). Negative consequences of such measures for a tree include symptoms of starvation at the point where it has been topped (death of bark below the cut due to nutrient deficit), as well as starvation of the roots. Both favor fungal infections which can negatively affect the structure of the wood. The stability of the tree and its breaking strength may decrease, therefore felling might be necessary for safety reasons.



Pic. 1: Topped plane tree in Tbilisi, July 2013

Some of the trees have been completely topped. Topping means to reduce or remove the tree crown or parts of it in the area of the main branches.

The Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V. in Deutschland (FLL, Society for Research of Landscape Development) refers to topping as a non-professional practice due to an "extensive, destructive reduction of the crown without regard to physiological needs" (FLL 2006). The American forest scientist and founder of Modern Arboriculture, Alex Shigo, wrote "topping of trees destroys not only the dignity of the tree but weakens it and makes it a safety risk" (Shigo 1994).

Topping represents a strong intervention in the balance of nature of the tree as a living being. The entire surface of assimilation is being removed at once. In addition to infections in the area of the cut due to decomposition by fungal activity, there is an undersupply of the roots, possibly causing their starvation. Dead roots provide an ideal breeding ground for fungi and thereby negatively affect the stability of the tree.

Plane trees try to compensate such interference and react with numerous new sprouts close to the cut. The new sprouts compete with each other and due to secondary growth as well as rot in the area of the cut they may break off. This also poses a risk to road safety.



Pic.2: Topped poplars, dead standing tree in Tbilisi, July 2013

For lime trees (*Tilia*) and poplars in Tbilisi, measures like those have led to immediate starvation of the affected trees.

Typical pollards with professional pruning were not encountered. In some narrow streets of Tbilisi, one can find trees whose branches on the trunk have been removed up to a tall height. Where there is space, trees are left untouched, so Tbilisi does have trees with a natural habitus according to their species.

2.3 Assessment of trunks and rooting zones

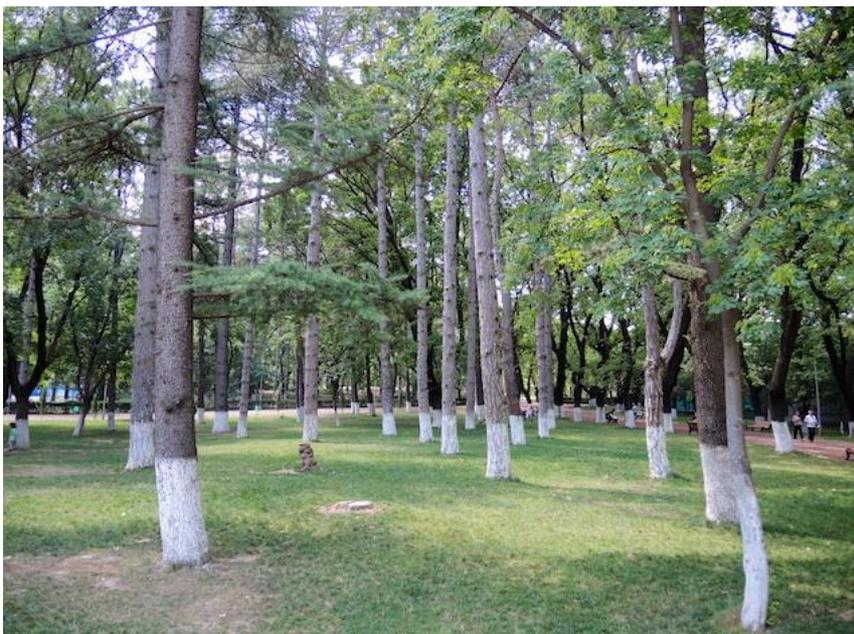
During Christmas season, it is common to install string lights in the trees. These are wrapped around the branches and the trunk, and often times not removed again.



Pic.3: Wrapped string lights in plane-tree in Tbilisi, July 2013

This leads to constriction of the branches and the trunk which can affect road safety and the vitality of the trees in the medium term. We found power and telephone lines, billboards and lighting facilities, which were mounted directly on or in trees.

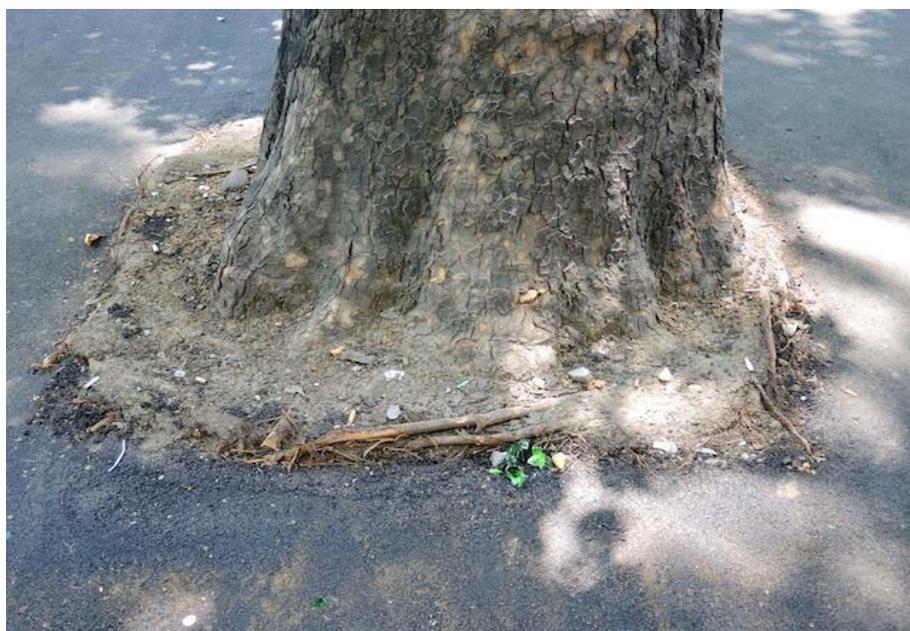
For trees along the roads as well as trees in private gardens it is common to paint up to two meters height of the trunks in white. It could not be figured out exactly why this is being done. It is possibly meant as a protection against evaporation or for increased visibility of the trees.



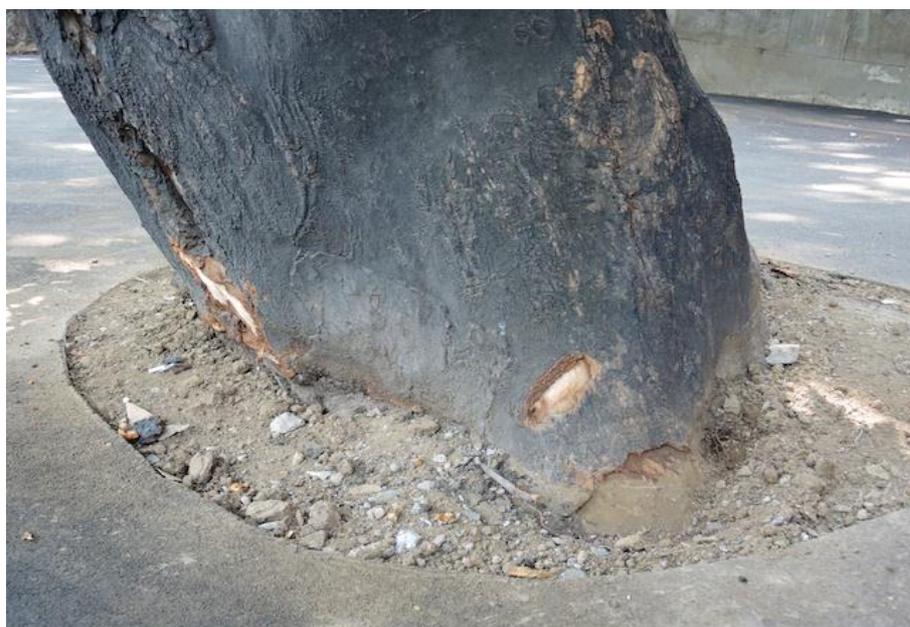
Pic.4: White painted trunks from pines and cedars in Tbilisi, July 2013

Depending on the location of the tree, the rooting zone is mostly sealed with the exception of a small open area around the stem. Many trees are completely tarred up to the root collar and do not have any free space in the rooting zone. The tree as a living being supplies itself through an interaction between above-ground and underground sprouts. To survive, the roots need water and nutrient salts as well as oxygen. Only a well-developed, vital rooting zone can ensure the stability of a tree and provide the supply of above-ground tree parts. Therefore, trees are sensitive towards sealing and compaction of the rooting zone.

Protective barriers for the tree trunk are rarely found. According to their location, some trees are damaged by car collisions.



Pic.5: Fresh tarred banquette up to the root collar of a plane-tree in Tbilisi, July 2013



Pic.6: Damaged trunk in Tbilisi, July 2013

2.4 Vitality of the trees

The trees that have been assessed generally have dense leaves and most of the time the crowns are harmoniously closed. Further examinations on the vitality of the trees have not been carried out in this initial consultation due to time constraints.

3. Analysis of the Tree Care Plan / the Tree Care in practice

3.1 Legal basis

In Georgia, there are currently no standards or laws relating to Tree Care. Professional associations and accident prevention regulations for horticulture or forestry are not in place. There is no specific training for arborists. Also, Tree Care is not a topic in other vocational trainings.

3.2 Procurement of Tree Care measures

In Tbilisi, Tree Care measures are carried out either by municipal employees or external contractors. The procurement of work related to pruning or felling of trees or groups of trees is done on basis of fixed-price agreements. As the nature of the works in question, especially concerning the pruning, is not being described in detail, there is much room for interpretation and relying on verbal agreements on how the trees have to be cut.

3.3 Professional knowledge and technique of pruning

Tree Care measures should be carried out with a handsaw in the first place. Chainsaws with bars between about 35 and 45 cm in length have been encountered. Hand saws or small-sized chainsaws designed for Tree Care are not being used and are also not currently available in Georgia.

The pruning is usually carried out very close to the trunk and is executed from within the aerial work platform with larger chainsaws.

Findings from Modern Arboriculture such as cut guidance, reducing the crown onto a lateral branch, etc. are not known in Georgia. Also, young trees are left to themselves and they are not properly formed early on by appropriate pruning measures.

3.4 Technical Equipment

Aerial work platforms are available in different sizes but they are technically outdated and inflexible in their movement, so the radius of action for the workers in the basket is extremely limited.

The workers operate either from within the basket or they climb out of the basket with the chainsaw, lacking protection.

The lack of technical equipment of the workers and the lack of knowledge of proper Tree Care throughout the country is leading to the described practices. Nevertheless, there are people who get angry about the results (such as truncated and mutilated trees) and demonstrate against that. This shows the strong emotional bond of the population to their trees.



Pic. 7: Timber yard of the municipality. Tbilisi in July 2013

3.5 Operational safety

The aerial work platforms are old and cannot be steered from within the basket. Safety measures such as to prevent overturning by overloading are not available. The workers do not wear any protective clothing, head or hearing protection.

Communication between the worker in the basket and the machinist on the ground requires the use of gestures, which makes it difficult and even dangerous to position the basket precisely.

4. Recommendations for an improved Tree Care

4.1 Developing norms and values for Tree Care and the preservation of trees

To preserve the tree population in the long term, it is necessary to rethink the way that trees and their surroundings are treated. The basis for this can be provided by a national regulatory framework. This framework should contain a description of the concepts of Tree Care and define appropriate measures and techniques. Such a framework could be set up by an NGO, such as the International Society of Arboriculture (ISA) or the Georgian Ministry of Environment. On the other hand, the persons responsible for carrying out tree maintenance have to be trained accordingly, which could be subject of a training programme. The "Curriculum for the European Tree Worker", published by the European Arboricultural Council (EAC), could serve as a basis.

4.2 Changes in procurement of Tree Care measures

After setting up a regulatory framework for Tree Care, the city of Tbilisi could require the procurement of Tree Care measures in accordance with those rules. Executing companies would have to prove that they have the necessary knowledge and appropriate skills and that they carry out the work according to the set up rules.

4.3 Introducing a Tree Protection Charter by the Tbilisi City Council

The city of Tbilisi can effectively protect its trees by introducing a Tree Protection Charter. A Tree Protection Charter defines which trees are protected by a city (e.g. trees with a specified trunk circumference). In order to fell a protected tree, the tree owner has to apply for an exemption to the statutes. The City Council could grant an exemption to the statutes under conditions such as a replacement planting. Currently there are no young trees available in Georgia, that could satisfy the requirements as a replacement planting. Therefore, a dedicated fee (such as in favor of Tree Care measures on inner city trees) could be required instead.

4.4 Keeping a tree cadastre for the city of Tbilisi

The trees of Tbilisi were last recorded in a tree cadastre in the late 1980's. At that time, the following data were collected: species, location (cartographical), size and age. Furthermore, the measures carried out on the tree and the costs involved were recorded. The cadastre has not been continued up to the present. Nevertheless, the data constitute as a useful basis for a new digital tree cadastre. The continuation of the tree cadastre in digital form is a necessary step in order to document the condition of the trees and the arboricultural measures. Also, with a cadastre in place, the city of Tbilisi can protect itself against claims for compensation in case of accidents.

However, it is important to note that this requires training of personnel responsible for the risk evaluation of trees in order to be able to detect damages or diseases of trees at an early stage.

4.5 Training municipal staff of the city of Tbilisi responsible for Tree Care measures

There is an urgent need to train the workers responsible for Tree Care measures accordingly. In the short term, a seminar could be held to improve the level of knowledge. Leveraging new media, knowledge portals could be opened around the topic. A dedicated website or an app for smartphones could provide in-depth knowledge for the workers. Information sources like that provide qualified support for questions and enable exchange of knowledge between colleagues within the country as well as with colleagues abroad.

4.6 Introducing tree climbing with ropes as an alternative to outdated aerial work platforms

Furthermore, it would be helpful to introduce tree climbing with ropes as an alternative to working with aerial work platforms in Georgia. Tree climbing with ropes enables a worker to gently reach any point in a tree and move accordingly in the tree without high technical overhead. In Germany, the training in tree climbing with ropes is bound by strict laws. Accident prevention and safety are a top priority. A similar training and guidance on the job is not yet feasible in Georgia. Nevertheless, the introduction of tree climbing with ropes could bring an increase in quality in Tree Care in the short term. Reduced to a few applications, with training by experienced climbers from abroad, the city's workers would learn to move safely in and around the tree. Along with the introduction of the hand saw, this could be the foundation for a new Tree Care in Georgia!



Pic. 8: Georgian Climber, working for the botanic garden of Tbilisi, July 2013

4.7 Creating appropriate education and training programmes for arborists

In the medium term it would be desirable to educate about Tree Care as part of a horticultural or forestry vocational training. International professional associations can provide valuable help in development of such training programmes.

4.8 Examination of critical trees by a team of experts

At the present time it is not recommended to purchase diagnostic equipment such as resistographs or sonic tomography devices. The interpretation of the results requires a lot of experience in order to draw the right conclusions. A misinterpretation could lead to unnecessary felling or, on the other hand, cause a serious accident if a supposedly safe tree would fall down. Such diagnostic should be done by experts, who offer their services worldwide.

5. Action plan

5.1 Creating a set of rules for Tree Care (draft)

Based on the regulatory frameworks that are currently valid in Germany, a preliminary version covering the basic topics of Tree Care could be established. This rule set would define technical terms and measures in more detail. The draft could then be settled with the participating elected officials and NGOs and finally be adopted.

5.2 Establishing of virtual training tools for arborists

A web-based portal could be developed that provides training materials with notes and sketches, and serves as a reference. This could include the implementation of a manual of Tree Care in the form of a website or app for smartphones that allows quick reference also in a mobile context.

5.3 Introduction and training of tree climbing with ropes

The currently available two sets of tree climbing equipment in Tbilisi could be increased. In the short term, a "learning by doing" workshop held in 2013 could train 2-4 city employees for a specific method of operation. Another climbing workshop for a wider range of interested people could start in spring 2014. It would be desirable to exchange with international organizations early on.

5.4 Continuation of the tree register of the city of Tbilisi in digital form

The city of Tbilisi is responsible for the safety and vitality of its trees. The condition of the trees and measures that have been taken should be documented.

In light of scarce financial resources, purchase or creation of a qualified tree cadastre is a challenge with many pitfalls. A digital tree cadastre can fulfill many tasks. If the municipality of Tbilisi decides to build a digital tree cadastre, the specific requirements have to be defined and personnel has to be made available and trained accordingly.

5.5 Substitution of Aerial work platforms

It is necessary to substitute the old, dangerous and awkward aerial work platforms step by step.

6. Summary

The pruning and Tree Care measures on the plane trees in the city of Tbilisi are not carried out according to accepted working methods. The practice of topping which dates back to the Soviet era is widespread. The reason for this is the lack of expertise, but also the lack of technical equipment of the work forces. In order to ensure the preservation of Tbilisi's tree population in the long-term and to prevent accidents, a change of views is necessary.

At first, a draft for a set of rules for Tree Care has to be established. This should begin with fundamental information about trees, Tree Care and pruning measures. A first draft should be ready until November 2013. The rule set can be extended with additional content further on.

Second, the Tree Care being practiced has to be changed. A first step could be a "learning by doing" workshop for municipal staff.

The introduction of tree climbing with ropes on the one hand offers improved security for the workers (which are now climbing without ropes) and on the other hand enables the workers to carry out Tree Care measures in a more professional way. Since there are already two sets of tree climbing equipment available, an introduction of a specific working method using tree climbing with ropes is possible in the short term (November 2013). Requirements apart from the climbing equipment are mechanical lockjacks and cambium protectors. In the following year an extensive training (1 week) could be held, part of it being a module about tree monitoring.

Tree Care measures should be carried out with a handsaw in the first place. These have to be acquired.

The existing aerial work platforms should one by one be replaced with modern, agile and flexible devices with higher safety standards.

Urban trees are exposed to many negative factors. They are required to be both, safe and aesthetical. The initiative inspired by the Georgian Minister of Environment, Mrs. Khatuna Gogaladze, contributes to this in a sustainable way.

7. List of references

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