Turkey's Rich Biodiversity through TANAP; a crossroads of two continents

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Abstract

Trans-Anatolian Natural Gas Pipeline (TANAP) Project is part of Southern Gas Corridor transporting gas from South Caspian Sea in Azerbaijan to Turkish and European markets. TANAP has 1.850 km length and 16 bcma initial phase capacity passing through 20 provinces in Turkey. Its influence is not limited to construction activities. This Mega Project created several ecological benefits, while filling certain gaps in the Country. 500m. corridor European nature information system, (EUNIS) Level 3 habitat map of TANAP Project is unique in Turkey and will create a rich database for the country. During baseline studies, new species of flora and fauna were discovered. Further studies are aimed for these species and TANAP is dedicated to contribute to their implementation. Biodiversity Action Plan (BAP) sensitively identified critical habitats, which is one of the rare samples for a linear project in the country. Biorestoration monitoring plan will measure the progress of the implementation of the mitigation hierarchy (i.e., avoid, minimize, rehabilitate and offset) set forth by BAP. Country specific data gaps are the main challenges during the biodiversity studies, which lead the Project to prepare an ecoregion approach (Olson et al. 2001) based Biodiversity Offset Strategy. Next step is the Biodiversity Offset Management Plan, which will enable the involvement of all stakeholders for the offset actions and ensure satisfactory execution with an integrated approach.

Introduction

The TANAP corridor starts from the Georgia-Turkey border, where it connects to the South Caucasus Pipeline Expansion Project (SCPx) and ends at the Turkey-Greece border, where it feeds into the Trans Adriatic Pipeline (TAP) in Europe (*Figure 1*). This means the Project traverses a rich biodiversity across the country from east to west.

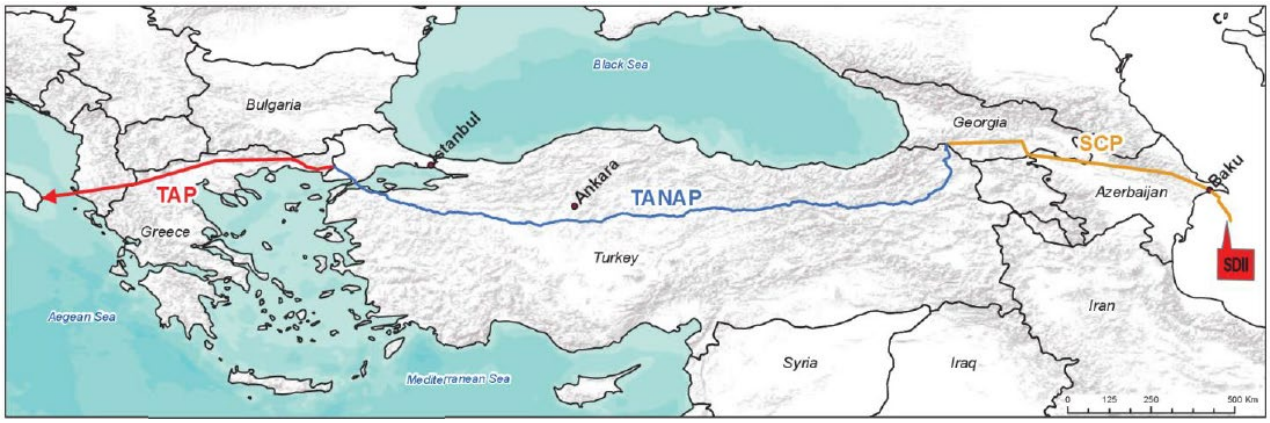

Figure-1 Project Location

Methodology

An International Environmental and Social Impact Assessment (ESIA) study was carried out for the Project beginning from the FEED phase. Supplementary package, to meet Performance Standard 6 of "IFC Performance Standards (2012)" and Performance Requirement 6 of "EBRD Environmental and

Social Policy and Performance Requirements (2014)", was prepared and disclosed on TANAP website [(1)], which are the Biodiversity Action Plan (BAP), Biodiversity Offset Strategy (BOS). Biodiversity Offset Management Plan will be prepared based on the recommendations proposed in the BOS, which is considered to be resulting in justice by ensuring a no net loss (NNL) and producing a net gain (NG) for biodiversity, at a broad area along the whole country until 2040.

Highlights from the Biodiversity Assessments of TANAP Project and future opportunities

TANAP is committed to managing the potential effects of the Project on biodiversity by implementing the **biodiversity mitigation hierarchy** (i.e. avoiding, minimizing, rehabilitating and offsetting).

The first three steps of the mitigation hierarchy have been incorporated in

- Inherently in Project design,
- ESIA
- BAP

Biological baseline data collection lead to the preparation of* 500m. corridor EUNIS Level 3 habitat map of TANAP Project, which is unique in Turkey and will create a rich database for the further country specific studies*:

Some highlights on the findings in TERRESTRIAL & FRESHWATER habitats:

- **87 Species of Conservation Concern (SCC)**,
- **One potential SCC**,
- **34 SCC**,
- **13 SCC fish species and one potential SCC macroinvertebrate,**

Among the various **endemics** identified along the route, the following **new species** to science were identified as arthropods;

Chrysolina n. sp., Tipula n. sp.1 (pls. see photo 1), Dioctria n. sp. 1, Dioctria n. sp. 2, Muzimes n. sp., Hilara n. sp. 1 (pls. see photo 2), Hilara n. sp. 2, Hilara n. sp. 3, Hextoma n. sp., as flora; Verbascum sp. Nov..

Protected and Sensitive Habitats were identified throughout the 500 m. Local Study Area (LSA) of the TANAP Pipeline Project to define the areas of a particularly sensitive nature for biodiversity and habitat conservation that deserve special attention such as avoiding traversing the following protected and sensitive habitats during construction. The construction corridor is 36m.

- Presence of national or internationally protected and conservation areas in the LSA are as follows:
    - National Parks;
    - Wetlands;
    - Wildlife Development Areas;
    - Natural Parks;

- Key Biodiversity Areas (KBAs);
- Ramsar Areas;
- Important Plant Areas (IPAs);
- Important Bird Areas (IBAs);
- Prime Butterfly Areas (PBAs);

- Presence of habitats with high conservation importance: These habitats which are part of ecosystems with high threats to biological diversity are mainly defined according to the National Biological Diversity Strategy and Action Plan for Turkey (steppe, coastal-sand dunes and mountainous forests ecosystems) as follows (Ministry of Environment and Forestry, 2007) [(2)]:
  - E1.00: Anatolian Gypsum Steppes;
  - E1.2B: Serpentine steppes;
  - E2.5: Meadows of the steppe zone;
  - G1.9 Non-riverine woodland with *Betula*, *Populus tremula*, *Sorbus aucuparia* or *Corylus avellana*
  - G1.A: Meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland;
  - G3.4: *Pinus sylvestris* woodland south of the taiga
  - G3.5: *Pinus nigra* woodland
- Presence of rivers crossed by the Project: In the 500 m LSA of the TANAP route, six different natural habitat types for freshwater habitats at Level III were identified;
  - C1.2 (Permanent mesotrophic lakes, ponds and pools),
  - C1.6 (Temporary lakes, ponds and pools (wet phase),
  - C2.2 (Permanent non-tidal, fast, turbulent watercourses),
  - C2.3 (Permanent non-tidal, slow, smooth-flowing watercourses),
  - C2.5 (Temporary running waters),
  - C3.6 (Unvegetated or sparsely vegetated shores with soft or mobile sediments).

Considering the baseline data and with further assessments conducted regarding PR/PS6, there are 67 terrestrial and 27 freshwater critical habitats identified within the BAP. There are no critical habitats for marine environment, neither critical marine species nor marine protected & conservation areas elaborated along the project route during the ESIA process. In addition, the area where the offshore section of TANAP route passes from is determined as a corridor for energy and infrastructure projects. Habitat Action Plans and Species Action Plans within the BAP were prepared to recommend mitigation measures throughout the construction period serving as a whole for the avoidance, minimization and rehabilitation strategy of the mitigation hierarchy such as below listed samples;

Key mitigation measures for terrestrial habitats and species

FOR HABITATS	• Top soil management • Collect endemic and/or non-endemic seeds of natural plants of the regions to control erosion at sloping areas • Use certain endemic flora species seeds for bio-restoration (additional seeds will be collected from nearby areas against erosion on sloping areas) • Locate project components on previously disturbed areas rather than new areas where possible • Maximize the use of existing corridors/roads • Avoid using sensitive areas if extra land is required for project activities • Control invasive flora species
FOR SPECIES	• Avoid construction during reproduction seasons of sensitive wildlife (Time constraints) • Seed or bulb collection, translocation, relocation • Giving some of the collected seeds of endemic species to the gene bank, use some of these seeds for biorestoration • Harvesting and storing herbaceous plants (which carrying SCC arthropod species eggs) near the ROW in the aerated conditions, so eggs can be hatched and individuals will not has any damage.

Key mitigation measures for freshwater habitats and species

FOR HABITATS	• Conduct construction works during the time when flow is low and limited timeframe (Time constraint: April-June) • Restore the water passages to the condition before the construction where possible • Minimize impact to riparian vegetation • Avoid impact and removal of gravel • Minimize erosion • Install silt screens and sediment traps • Restore riparian vegetation
FOR SPECIES	• Avoid construction during reproduction seasons of freshwater fish (Time constraints) • Minimize habitat loss • Restore the bottom structure • Restore the riparian vegetation (spawning areas)

Invasive Species Guidance Document and Biorestoration Monitoring Plan are the supplementary documents of the BAP, which include additional mitigation measures and monitoring requirements. Based on the social impact assessment studies along the TANAP Project route, Muhtar, the governor of the village, survey forms included many ecological questions such as; endangered and indigenous (endemic) animals and/or plant species, seasonal harvest, livestocks, beekeeping activities, hunting activities, etc., which met the requirements as per TANAP Social Policy. Policy requires trainings and awareness programme to be provided to all TANAP employees and its contractors to ensure that TANAP social policy and commitments for the project are well understood and are being implemented by all employees, including local ones, which comprise the majority of the unskilled workforce. The environmental induction trainings and toolbox talks are organized for this purpose

to emphasize the mitigation measures in BAP for site specific CHs and FCHs. The main challenges during the implementation phase of BAP is; climate change and for some of the contractors, having unexperienced biologists to be working for the contractors on site. TANAP Headquarters has experienced staff in its own management structure guiding both Contractors and TANAP Site team. Climate change effects was observed and mitigated with close communication with local university experts.

Terrestrial critical habitats cover only 0.39% of the ESIA (500 m) corridor and 5.6% of the ROW (36 m). Considering OP 4.04 WB definitions, quantitative impact assessment was conducted using the GIS based approach of ESIA Report. That assessment revealed that there is low degree of impacts expected on natural and critical habitats, therefore significant permanent and long term impacts are not expected and the defined mitigation measures are sufficient for the recovery of habitats, therefore offsets are not required according to the local experts. However, the main objective of the TANAP Project within its biodiversity studies is to obtain net gain. Therefore, to meet the last mitigation **hierarchy, BOS was** prepared.

The main purpose of BOS is to provide a practical and achievable offset scheme for TANAP. As the TANAP Project covers such a large geographic area and as biodiversity varies greatly across this extent, an ecoregion approach (Olson et al. 2001) [(3)] was used to ensure that losses caused by the TANAP Project and gains resulting from offset actions were calculated within the same geographically distinct assemblage of species, natural communities and environmental conditions (i.e., like-for-like concept). Each of the nine ecoregions crossed by the TANAP project therefore represents an important spatial unit for the application of the Biodiversity Offset Strategy. An offset accounting methodology was developed. This accounting method has been defined to permit demonstration of **No Net Loss or Net Gain** for biodiversity taking into account the pre-existing disturbance of each habitat type within the ecoregions, the suitability of each habitat to host the species of conservation concern, the level of conservation significance of certain areas across the Project and finally the benefits of rehabilitation activities identified in the BAP. Residual losses for biodiversity is expressed as **Biodiversity Value (Vh)** and **net loss of habitat in hectares (*Ha*)**, the latter to give additional spatial context to the biodiversity value score.

The results of the calculation indicates that residual effects of the TANAP Project are identified in both modified (43% of the total net loss in hectares) and natural habitats (57% of the total net loss in hectares) in all ecoregions affected by the Project. In particular, the largest residual impacts were identified in the **Caucasus Mixed Forests** and **North Anatolian Conifer** and **Deciduous Forests**, and within these ecoregions the **Irano-Anatolian steppes and Calciphilous alpine and subalpine grasslands** are among the natural habitats with the greatest adverse residual effects to biodiversity value. Comparatively **few residual effects** to biodiversity value were identified in the **Balkan Mixed Forests, Central Anatolian Steppe, and the Aegean and Western Turkey Sclerophyllous and Mixed Forests**. Following the quantification of the residual effects, offset concepts and tactics that can be applied to achieving No Net Loss or Net Gain are addressed within the BOS and the process for developing a Biodiversity Offset Management and Monitoring Plan for the TANAP Project is outlined. **Biodiversity Offset Management Plan (BOMP)** will be prepared by the end of 2019 and the entire offsetting program will be implemented and completed **by 2040**.

References

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