

Dokuz Eylul University SDG Project Mapping Report Externally Funded Research Projects 2021–2026

Executive Summary

Dokuz Eylül University's externally funded project portfolio for the 2021–2026 period highlights a highly active, multi-disciplinary research ecosystem deeply aligned with the **United Nations Sustainable Development Goals (SDGs)**. Supported by both national (TÜBİTAK, TÜSEB, AFAD) and international (EU Horizon 2020, Horizon Europe, Erasmus+, Jean Monnet) funding, these projects transform academic knowledge into high-impact societal and technological solutions.

-  **SDG 3: Good Health and Well-being:** This is the university's most intensive research area. Efforts are concentrated on advanced cancer research (biomarkers and immunotherapy), medical device development, and neurological health. International AI-based projects for predicting psychiatric relapses further underscore DEU's leadership in clinical excellence.
-   **SDG 11 & 13: Sustainable Cities and Climate Action:** Following the region's seismic needs, DEU leads massive national efforts to map active fault lines and improve structural seismic safety. These projects provide the foundational data required for urban resilience and disaster management.
-   **SDG 14 & 6: Life Below Water and Clean Water:** The Institute of Marine Sciences and Technology manages critical international observation networks like **EMODNET**. Research also extends to sustainable water management, treating micro-pollutants in urban wastewater, and monitoring coastal biodiversity.
-    **SDG 4, 5 & 10: Quality Education and Social Inclusion:** Through Erasmus+ and national social science funds, the university addresses digital literacy, refugee entrepreneurship, and social cohesion. Research into the historical role of women and inclusive urban planning further supports these social equity goals.
-   **SDG 7 & 12: Clean Energy and Circular Economy:** Engineering faculties focus on green hydrogen production, pyrolysis for energy recovery, and sustainable textile materials. These projects align with global transitions toward a circular economy and reduced carbon footprints.


The below infographic serves as a visual anchor for the entire report. It provides a high-level view of the distribution of all projects across the 17 SDGs and clearly distinguishes between national (TÜBİTAK/TÜSEB) and international (Horizon/Erasmus+) funding.

Externally Funded Projects vs. UN SDGs (2021–2026)

Visualizing research project alignment with United Nations Sustainable Development Goals, focusing on health, resilience, and marine ecosystems.



Funding Landscape: National vs. International

 **National Funding (TÜBİTAK & TÜSEB)**
Comprises bulk of high-density technical and medical research, with emphasis on 1001 (Scientific Research) and 1002 (Rapid Support) programs.

 **International Funding (Horizon & Erasmus+)**
Focused on erous burder collaboration, student/teacher digital literacy, social cohesion for refugees, and large-scale environmental monitoring (EMODNET).

1. Methodology and Mapping Logic

This report provides a comprehensive technical synthesis of the university's research and innovation portfolio, derived from the List of Projects Funded by External Sources. The objective of the study is to align academic output with the United Nations Sustainable Development Goals (SDGs) in order to measure global impact and regional contribution.

Mapping Framework: Projects were mapped to specific SDGs using a multi-layered heuristic approach:

- **Keyword Analysis:** Mining project titles for technical indicators (e.g., "seismic," "immunotherapy," "microplastics").
- **Objective Alignment:** Evaluating the research intent against the 169 targets of the UN SDG framework.
- **Faculty Domain:** Cross-referencing the contributing academic unit's core mission with the most relevant global goal.

Technical Translation: To facilitate international stakeholder engagement and peer review, all Turkish project titles have been translated into professional, academic English. High-precision nomenclature was prioritized—for instance, entomological terms like *European Grapevine Moth* and geological terms like *Paleoseismology* and *Menderes Massif* were used to ensure scientific accuracy.

2. Funding Source Landscape: Strategic Evolution

The university's funding landscape demonstrates a mature research ecosystem transitioning from basic scientific discovery to applied, high-impact societal and industrial solutions.

Financial Overview: The identified portfolio represents a significant financial investment, totaling over **150 million TL** and approximately **4.5 million EUR**. This diversified capital reflects a robust ability to secure both national competitive grants and high-value international funding.






Primary Funding Entities:

- **TÜBİTAK (National):** The backbone of the portfolio, ranging from the 1001 (Scientific Excellence) and 1002 (Fast Track) programs to the larger 1007 (Public Research) and 1004 (Center of Excellence) initiatives.
- **TÜSEB (Health):** A critical source for clinical trials, drug development, and system biology, particularly for oncology and neurodegenerative research.
- **International (EU/Horizon/PRIMA):** Strong presence in Horizon 2020 and Horizon Europe (Innovation), Erasmus+ (Capacity Building), and specialized leadership grants like the Global Brain Health Leaders.
- **Regional:** Focused interventions funded by AFAD (Disaster and Emergency Management Directorate of Türkiye) and the Ministry of Culture and Tourism.

The Strategic Shift (2024–2026): A distinct trend emerges in the 2024–2026 pipeline. While early projects (2018–2021) were dominated by TÜBİTAK 1001 basic research, the newer cohort shows a surge in **TÜBİTAK 1505 (University-Industry Cooperation)** and **TÜBİTAK 3005 (Social Innovation)** grants. This indicates a strategic shift toward the "Green Transformation" and "Circular Economy," focusing on industrial application and the social integration of disadvantaged groups.

3. SDG Density and Thematic Concentration

The university's research density is concentrated in five high-impact areas:

-  **SDG 3 (Good Health & Well-being):** The largest cluster, anchored by the Oncology Institute and Faculty of Medicine. Research ranges from exosomal markers for dementia to machine-learning-based platforms for cancer immunotherapy and pediatric diabetes management robots.
-  **SDG 9 (Industry, Innovation & Infrastructure):** Driven by the Faculty of Engineering, focusing on 3D-printable materials, advanced thermal-resistant zeron-materials, and the integration of smart antennas into industrial panels.
-  **SDG 11 (Sustainable Cities & Communities):** A cornerstone of regional resilience. The university leads extensive paleoseismology studies on active faults in the Izmir-Balıkesir transfer zone and promotes the preservation of acoustic and structural heritage in historic timber mosques.
-  **SDG 13, 14 & 15 (Environmental Impact):** Led by the Institute of Marine Sciences and the Faculty of Science, these projects tackle climate-risk hydrological management, marine functional biodiversity (EMODNET), and genomic monitoring of regional species like the Chukar Partridge.
-  **SDG 4 (Quality Education):** Focused on modernizing pedagogical frameworks through gamification, AR/VR integration, and digital literacy training for both university students and educators working with disadvantaged groups

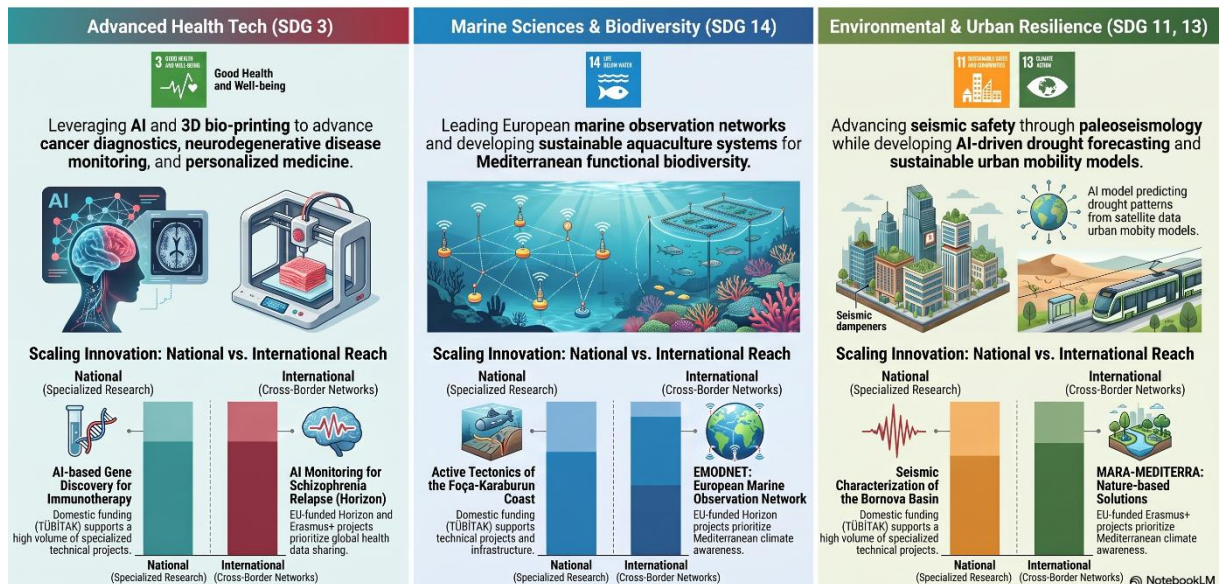
4. Faculty and Institute Contributions

The following table delineates the primary drivers of externally funded research and their thematic focus.

Faculty/Institute/Center	Primary SDG Alignment	Key Research Themes
Faculty of Engineering	SDG 9, SDG 11, SDG 13	Materials science, seismic risk, wastewater recycling, Green Transformation.
Faculty of Medicine	SDG 3	Neurodegenerative diseases, clinical diagnostics, AI-assisted imaging.
Buca Faculty of Education	SDG 4, SDG 10	Digital literacy, STEAM education, gamification, social justice.
Institute of Oncology	SDG 3	Cancer immunotherapy, metastatic inhibition, molecular therapeutics.
Institute of Marine Sciences	SDG 14, SDG 13	Marine biodiversity, aquaculture, geosphere-hydrosphere interaction.
Nursing Faculty	SDG 3, SDG 4	Telerehabilitation, pediatric care robots, health literacy.
Faculty of Architecture	SDG 11, SDG 12	Cultural heritage preservation, sustainable urban planning, microalgae facades.
Faculty of Science	SDG 15, SDG 2	Genomic monitoring, biotechnology, organic chemistry.

Global Impact: Thematic Research Excellence (2021–2026)

This infographic visualizes the university's strategic research portfolio between 2021 and 2026. It highlights how domestic funding (TÜBİTAK, TÜSEB) and international partnerships (Horizon Europe, Erasmus+) drive innovation in Advanced Health Tech, Marine Sciences, and Environmental Resilience.



5. Comprehensive Project Mapping Registry (2021–2026)

Project Title (English)	Funding Source	Faculty/Institute	Mapped SDG	Timeline
European Grapevine Moth and Mediterranean Fruit Fly Biotechnical Control	TÜBİTAK 1007	Faculty of Science	SDG 2	2021-2025
Improving Soil Properties with New Bio-fertilizers (VALUEFARM)	TÜBİTAK 1071	Faculty of Engineering	of SDG 2	2020-2024
Quantitative Phase Imaging of Circulating Cancer Cells (CTCs) Stiffness	TÜBİTAK 1003	Oncology Institute	SDG 3	2017-2021
Efficacy of Dutasteride in BCG Immunotherapy for Bladder Cancer	TÜBİTAK 1003	Faculty of Medicine	of SDG 3	2018-2021
Distribution of Hantavirus in Rodent Species in Eastern Turkey	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2018-2021
iNKT Cell Signaling and Proliferation in Human Immunity	TÜBİTAK 1001	IBG Institute	SDG 3	2019-2021
Bilirubin Impact on NLRP3 Inflammasome Activation	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2019-2021
Patient-Derived Xenografts for Personalized Lung Cancer Therapy	TÜBİTAK 1001	IBG Institute	SDG 3	2019-2022
Medication Adherence Intervention in Kidney Transplant Recipients	TÜBİTAK 1001	Nursing Faculty	SDG 3	2019-2022
Early Prognostic Markers in Schizophrenia-Bipolar Spectrum	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2019-2022
Tropical Treatment Method Development for Macular Corneal Dystrophy	TÜBİTAK 1003	Faculty of Medicine	of SDG 3	2019-2022
Cognition and Eye Movement Assessment in Dementia Cases	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2019-2022
Induced Microglia from Mononuclear Cells in Alzheimer's Patients	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2019-2021
Statistical Decision Support Systems for Deceased Donor Matching	TÜBİTAK 1003	Faculty of Medicine	of SDG 3	2019-2022
Machine Learning for Gene Discovery in Cancer Immunotherapy	TÜBİTAK 1003	Faculty of Engineering	of SDG 3	2020-2023
ADAMTS-8 Gene Regulation and Inflammation in Colon Cancer	TÜBİTAK 1001	Oncology Institute	SDG 3	2019-2022
Polarized Microglia Exosomal microRNAs in Stem Cell Differentiation	TÜBİTAK 1001	Faculty of Medicine	of SDG 3	2019-2022
PDT-MRI Molecular Theranostics via Tempo-Phthalocyanines	TÜBİTAK 1001	Faculty of Science	SDG 3	2019-2023
Sirtuin Inhibitor Nanoparticles for Neurodegeneration Protection	TÜBİTAK 1001	Faculty of Science	SDG 3	2019-2022



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Automated Carotid Stenosis Determination via CT Angiography	TÜBİTAK 1005	Health Services VS	SDG 3	2020-2022
Medical Textile Development with Natural Therapeutic Agents	TÜBİTAK 1505	Faculty of Engineering	ofSDG 3	2021-2022
Schizophrenia and the Social Brain: Autistic Sensitivity Dimensions	TÜBİTAK 2247-A	Faculty of Medicine	ofSDG 3	2021-2024
Online Group Therapy for Post-Traumatic Growth in Breast Cancer	TÜBİTAK 1002	Faculty of Letters	SDG 3	2021-2022
Social Cognition and Connectivity in Multiple Sclerosis Patients	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2021-2022
Exosomal Hemoglobin Levels in Mild Cognitive Impairment	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2021-2022
Impact of Closed IV Catheter Systems on Pediatric Patient Success	TÜBİTAK 1002	Nursing Faculty	SDG 3	2021-2022
Speed of Processing Training in Mild Cognitive Impairment	EU Brain	Global Faculty of Letters	SDG 3	2019-2024
Death Receptor Signaling in Tumor Immune Editing	EU Horizon IBG Institute		SDG 3	2018-2022
Bridge Between Community and Dementia Research (TURQUOISE)	EU Brain	Global Faculty of Medicine	ofSDG 3	2021-2023
A Universal Strategic Necessity: From Molecule to Drug	EU Erasmus +	IBG Institute	SDG 3	2022-2024
AI Monitoring System for Schizophrenia Relapse Prediction	EU Horizon	Faculty of Medicine	ofSDG 3	2023-2028
Retinal Structure Investigation in First Episode Psychosis	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2022-2023
CaMKII Isoenzyme and Calcium Signaling in Schizophrenia	TÜBİTAK 1001	Faculty of Medicine	ofSDG 3	2022-2025
Histological Examination of Quercetin on Testicular Damage	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2022-2023
Telerehabilitation and Motor Imagery for Multiple Sclerosis Pain	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2022-2023
Adipogenic Gene Regulation via Boric Acid and Calcium Fructoborate	TÜBİTAK 1002	Health Sci Inst	SDG 3	2022-2023
Functional Mobility and Dual Tasks in Duchenne Muscular Dystrophy	TÜBİTAK 1002	PT & Rehab Faculty	SDG 3	2022-2023
Free Visual Scanning in High-Risk Psychosis Individuals	TÜBİTAK 1002	Faculty of Medicine	ofSDG 3	2022-2023
Mechanosensitive Ion Channels in Colorectal Cancer Metastasis	TÜBİTAK 1001	Oncology Institute	SDG 3	2023-2025
Role of Copper-Related Genes in Cardiac Glucose Uptake	TÜBİTAK 1001	Health Sci Inst	SDG 3	2023-2026
EGFR-Targeted Nanoplatforms in Breast Cancer Plasticity	TÜBİTAK 1001	Faculty of Medicine	ofSDG 3	2023-2026



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Ceramide Impacts on Overian Cancer Organoid Phenotypes	TÜBİTAK 1001	Oncology Institute	SDG 3	2023-2026
Neuro-Damage Biomarkers and Advanced Warning Systems	TÜBİTAK 1004	Brain Dynamics Center	SDG 3	2023-2027
Diagnosis Algorithm for Primary Progressive Aphasia via AI	TÜBİTAK 1001	Faculty of Medicine	ofSDG 3	2023-2026
AI Performance in Differential Diagnosis of Chronic Pain	TÜBİTAK 1001	Faculty of Medicine	ofSDG 3	2024-2027
Digital Health Literacy for Cancer Patient Nutrition	EU Erasmus +	Oncology Institute	SDG 3	2025-2027
Prototyping Electrochemical Aptasensors for Cancer Immunotherapy	TÜSEB	Oncology Institute	SDG 3	2026-2028
Speed of Processing Training in MCI Patients	EU Global Brain	Faculty of Letters	SDG 4	2019-2024
Enhancing Digital Literacy of University Students	EU Erasmus +	Buca Education	SDG 4	2019-2022
STEAM Education Competencies for Gifted Students	EU Erasmus +	Buca Education	SDG 4	2019-2022
Contextualizing Design-Based Pedagogy in Teacher Training	EU Erasmus +	Buca Education	SDG 4	2020-2023
Digital Learning Materials Through Gamification	EU Erasmus +	Buca Education	SDG 4	2022-2025
Trans-national STEM Teacher Education for Sustainability	EU Erasmus +	Buca Education	SDG 4	2023-2026
Augmented Reality in Pre-service Teacher Material Design	TÜBİTAK 3005	Buca Education	SDG 4	2024-2026
Interactive Reading Illustration Design for Primary Students	TÜBİTAK 1002	Buca Education	SDG 4	2024-2025
AI-Driven Skills Enhancement and Green Transformation in Education	AB Erasmus +	Buca Education	SDG 4	2025-2028
Empowering Student Voices: New SVSJ Directions	TÜBİTAK 2232	Buca Education	SDG 4	2025-2028
Impact of Psychological Violence on Women's Self-Defining Memories	TÜBİTAK 3501	Faculty of Letters	SDG 5	2017-2022
Gender Image in Primary School Curricula (1923-2023)	TÜBİTAK 1001	Buca Education	SDG 5	2023-2026
Gender Diversity on Corporate Boards for Sustainability	EU Erasmus +	Faculty of Business	SDG 5	2022-2024
Empowering Women Entrepreneurs in Workforce Transitions	EU Erasmus +	Faculty of Business	SDG 5	2025-2028
Receiving Environment Discharge Limits: Little Menderes Basin	TÜBİTAK 1003	Faculty of Engineering	ofSDG 6	2018-2021
Microplastics and Micropollutants in Industrial/Surface Waters	TÜBİTAK 1001	Faculty of Engineering	ofSDG 6	2022-2024



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Advanced Bio-based Solutions for Hormonal Risks in Irrigation	TÜBİTAK 1071	Faculty Engineering	ofSDG 6	2025-2028
Multi-objective Optimization of Solar-Hydrogen Energy Systems	TÜBİTAK 2535	Faculty Engineering	ofSDG 7	2021-2023
Smart Bargaining in the Services Sector: AI and Challenges	EU Grants	Faculty Economics	ofSDG 8	2024-2025
Investor Behavior Analysis in Crypto-Currency Markets	TÜBİTAK 1001	Faculty of Business	SDG 8	2021-2023
Business Intelligence Platform for Crowdfunding Projects	TÜBİTAK 1002	Faculty Economics	ofSDG 8	2021-2022
3D Printing of Hydrogel-Cellulose Meniscus Tissue Scaffolds	TÜBİTAK 1001	Faculty Engineering	ofSDG 9	2017-2021
Ground Materials for High Thermal Cycles	TÜBİTAK 1001	Faculty Engineering	ofSDG 9	2018-2021
High Capacity/Low Emission Condensing Central Heating Design	TÜBİTAK 1505	Faculty Engineering	ofSDG 9	2019-2021
Modeling Fatigue Damage via Peridynamic Theory	TÜBİTAK 1002	Faculty Engineering	ofSDG 9	2020-2021
3D Printable Pozzolanic Mortars: Engineering Properties	TÜBİTAK 1001	Faculty Engineering	ofSDG 9	2021-2025
Large-Scale Cable-Driven Parallel 3D Printer Development	TÜBİTAK 1001	Faculty Engineering	ofSDG 9	2023-2025
Energy Harvesting for Smart Solar Shading Systems	TÜBİTAK 1002	Faculty of Arch	SDG 9	2025-2026
Refugee Entrepreneurship Support in Tourism	EU Erasmus +	Faculty of Business	SDG 10	2023-2025
Social Resources in Wellbeing of Migrant Women	TÜBİTAK 1002	Faculty of Letters	SDG 10	2022-2023
Syrian Refugee and Local Women Cohesion Program	TÜBİTAK 1001	Faculty of Letters	SDG 10	2024-2027
Deaf Chefs Learning Vegan Cuisine: Inclusive Education	EU Erasmus +	Tourism Faculty	SDG 10	2024-2026
Paleoseismology of Active Faults in Izmir Residential Areas	TÜBİTAK 1001	Faculty Engineering	ofSDG 11	2018-2021
Geodynamic Relationship: Izmir-Balikesir and North Anatolian Faults	TÜBİTAK 1001	Faculty Engineering	ofSDG 11	2018-2022
Seismic Performance of Precast Concrete Buildings	AFAD	Faculty Engineering	ofSDG 11	2023-2026
Paleoseismological Features of Turkish Active Faults	TÜBİTAK 1007	Faculty Engineering	ofSDG 11	2023-2026
Preservation of Acoustic Heritage in Historic Wooden Mosques	TÜBİTAK 1001	Faculty of Arch	SDG 11	2024-2027
Integrated Microalgae Facades for Climate Resilience	TÜBİTAK 1001	Faculty of Arch	SDG 11	2019-2023



Sustainable Food Consumption Behavior Change	EU Erasmus +	Izmir VS	SDG 12	2018-2021
Life Cycle Analysis of Apparel Product Environmental Impact	TÜBİTAK 2244	Faculty Engineering	ofSDG 12	2020-2027
Sustainable Groundwater Management via Earth Observation	EU Horizon	Faculty Engineering	ofSDG 13	2020-2024
Climate-Risk: Water Management Under Climate Change	TÜBİTAK 1003	Faculty Engineering	ofSDG 13	2018-2021
Drought Area Prediction via Machine Learning	TÜBİTAK 1002	Faculty of Science	SDG 13	2024-2025
Circular Economy for the Sustainable Earth Spheres	EU Horizon	Faculty Engineering	ofSDG 13	2024-2028
Integrated Coastal Functional Biodiversity Monitoring	EU Horizon	Inst Marine Sci	SDG 14	2023-2027
European Marine Observation and Data Network (EMODNET)	EU Horizon	Inst Marine Sci	SDG 14	2016-2025
Carbon Stock Determination in Posidonia oceanica Meadows	TÜBİTAK 1001	Inst Marine Sci	SDG 14	2024-2027
Hantavirus Presence in Rodent Populations	TÜBİTAK 1001	Faculty Medicine	ofSDG 15	2018-2021
Genomic Monitoring of the Chukar Partridge (Alectoris chukar)	TÜBİTAK 1001	Faculty of Science	SDG 15	2025-2028
Taxonomic Reconstruction of Anatololacerta via Genome Markers	TÜBİTAK 1001	Faculty of Science	SDG 15	2023-2026
Civil Society Standing in Climate and Environment Litigation	TÜBİTAK 3005	Law Faculty	SDG 16	2025-2026

6. Strategic Takeaways

- Transition to Applied Innovation:** The university has successfully evolved from a portfolio of fundamental scientific research (TÜBİTAK 1001) toward higher Technology Readiness Levels (TRL). The rise in TÜBİTAK 1505 and 1505-like industrial collaborations indicates a strategic pivot toward commercialization and the "**Green Transformation**" of the Turkish industrial sector.
- Interdisciplinary Health & Engineering Synergy:** A significant percentage of high-budget projects involve the convergence of materials science and clinical medicine. Examples like the "**3D Printing of Meniscus Tissue Scaffolds**" and "**AI-Based Cancer Immunotherapy Platforms**" establish the university as a leader in medical biotechnology.
- Regional Disaster Resilience Hub:** Through extensive paleoseismology projects and AFAD-funded seismic performance studies, **the university serves as the primary technical advisor for the Izmir region's** earthquake preparedness and urban safety (SDG 11).
- Social Innovation and Inclusivity:** The portfolio demonstrates a **deep commitment to social cohesion, specifically targeting Syrian refugees, women in the workforce, and**

disadvantaged students. The transition into TÜBİTAK 3005 (Social Research) reflects an institutional goal to mitigate regional inequalities (SDG 10).

5. **Environmental Leadership in the Mediterranean:** Large-scale international grants (Horizon Europe/EMODNET) **underscore the university's role in marine biodiversity and sustainable water management.** The focus on "**Circular Economy**" and "**Carbon Stock**" analysis in *Posidonia oceanica* meadows positions the institution at the forefront of Mediterranean climate action (SDG 13/14).

