In cadrul etapei din anul 2021 au fost realizate toate activitatile prevazute in Planul de realizare si au fost obtinutea toate **rezultatele masurabile estimate**:

- Model experimental de proiectare si testare a senzorului electrochimic pentru determinarea nitritului;
- Model experimental de proiectare a materialului suport pentru imprimarea electrozilor;
- Senzor electrochimic caracterizat si optimizat pentru determinarea nitritului;
- Model experimental de integrare a senzorului de nitrit intr-un lizimetru realizat la nivel de laborator;
- Model experimental de proiectare a unor lizimetre miniaturizate;
- Diseminarea rezultatelor prin participare la manifestari stiintifice internationale (2 postere), publicarea a 3 articole in reviste cu factor ISI si pregatirea unui manuscris pentru trimitere spre publicare in revista Nanomaterials-MDPI;
- Vizita de lucru a partenerilor romani la coordonator/Vizita de lucru a partenerului roman EPI SISTEM la partenerul spaniol Metrohm Dropsens.
- Elaborarea Raportului stiintific si tehnic.

Rezultatele verificabile preconizate in Planul de lucru pentru anul 2021

- ✓ Senzor functionalizat pentru determinarea nitritului
- ✓ Senzor de nitrit caracterizat si optimizat
- ✓ Materiale suport de electrod caracterizate
- ✓ Materiale caracterizate si utilizate la imprimarea 3D a electrozilor
- ✓ Senzor integrat intr-un lizimetru miniaturizat la scara de laborator
- ✓ Prototip de lizimetru portabil
- ✓ Prototip a interfetelor de lucru
- ✓ Diseminare rezultate - publicare articole, participare la manifestari stiintifice
- ✓ Manuscris/Articol publicat
- ✓ Vizite de lucru
- ✓ Elaborarea raportului stiintific

Rezultatele obtinute in anul 2021 corespund celor propuse.

In aceasta etapa sensorul de nitrit a fost caracterizat si optimizat, a fost realizata integrarea acestuia intr-un dispozitiv miniaturizat la scara de laborator.

During the 2021's phase, all the activities specified in the Implementation Plan were carried out and all the estimated measurable results were obtained:

- Experimental model for designing and testing the novel electrochemical sensor for nitrite determination;
- Experimental design model of the support material foe electrode printing;
- Novel electrochemical sensor characterized and optimized for nitrite determination;
- Experimental model of the nitrite sensor integrated in a lysimeter at laboratory scale;
- Experimental model for designing miniaturized lysimeters;
- Dissemination of results by participating in international scientific events (1 oral presentation, 1 poster), publication of 4 articles in ISI coted journals and preparation of a manuscript for publication in Nanomaterials-MDPI journal;
- Working visit of the Romanian partners to the coordinator/ Working visit of the Romanian partner EPI SISTEM to the Spanish partner, Metrohm Dropsens;
- Elaboration of the scientific and technical report.

The verifiable results expected to be obtained in the working plan for 2021 are:

- ✓ Functionalized sensor for nitrite determination;
- ✓ Characterized and optimized nitrite sensor;
- ✓ Characterized electrode support materials;
- ✓ Characterized materials and their use in 3D printing of electrodes;
- ✓ Integrated nitrite sensor in a miniaturized lysimeter at laboratory scale;
- ✓ Prototype of portable lysimeter;
- ✓ Prototype of working interfaces;
- ✓ Results dissemination –manuscripts publication, participation at international scientific events;
- ✓ Manuscript/ article published;
- ✓ Working visits
- ✓ Elaboration of scientific and technical report.

All the obtained results in 2021 correspond to the proposed ones. At this stage the nitrite sensor was characterized and optimized, its integration was performed in a miniaturized device at laboratory scale.