



Preliminary Conclusions

May 18th, Rome

Overall Remarks

- Participation of key agencies (ASI, DLR, CNES, NASA, JAXA, CSU, ESA),
- Large participation > 200 persons, from 18 countries,
- Good participation of Terrestrial & Space industries,
- Confirm interest and commitment to bio-regenerative life support, well covered in the presented roadmaps (CSU, JAXA, NASA),
- Strong Motivation for International collaboration (JAXA, CSU,..)
- Targeting to demonstrate closed loop technologies on board ISS,
- Life Support Requirements for Exploration missions should be elaborated, (CIS Lunar, Moon and Mars surface,)



Flight Experiments & Technology Demonstrations, Analog Testing

- Major achievements in Space : Veggie, ArtEMISS, AquaPad,
- The multi-disciplinary team approach (Engineering and Scientists) during flight hardware development resulted in strong added value.
- Faster access to space remain a key issue to validate techno/sciences,
- Need of Ground Analog demonstrator is proven (e.g. Antarctica, MELiSSA Pilot plant, BIOS,...),
- High degree of closure increases the challenge but brings more robust data.
- Mechanistic model and prediction is **key**,



Water, Food, Waste & Safety

- Photo-bioreactors are now demonstrated in orbit, First Step: done !
- Grey water treatment/membranes is a robust demonstrated technology but suffers of the TRL death valley syndrome...Next Step: IOD,
- TRL of Urine/nitrification has significantly in terms of Space adaptation and flight experiments, (TRL ~4), Next Step : Concept for IOD,
- Innovative technologies are allowing plant response characterization to their environment,
- Several studies addressed radiation impacts on plants and algae. Plants in general are less sensitive than animals and humans,
- High diet closure production system needs mass reduction..



Terrestrial Applications and Societal impacts

- There is a clear potential for Close Life Support applications to circular economy.
- Opportunity for Earth applications identified: requires joint development with terrestrial industry.
- The need to bring together the (basic) research together with the R&D of bigger companies (see the Capture acceleration concept).
- Financing of technology demonstrators are key to develop new concepts, and attract private fund and investors,
- Education and participation of Citizen is crucial,

