

***ESTIMATION OF CONCENTRATIONS OF
RADIONUCLIDES IN ESTONIAN GROUND
WATERS AND RELATED HEALTH RISKS***

Summary and conclusions

Madis Kiisk,
Institute of Physics
University of Tartu



Where we were before twinning project?

- *Considerably well established database of ^{226}Ra and ^{228}Ra for Cm-V aquifer to make general conclusions for that specific aquifer*
- *Poor database for other aquifers*
- *Some information about other nuclides (U, ^{210}Po , ^{210}Pb , ^{222}Rn) exists*
- *In 2005, a report “Health Risk effects of Radionuclides in drinking waters” issued by Radiation Protection Center, was the first study concluding current situation and gave some suggestions for future actions. For example:*
 - *Existing data and studies carried out, indicated about 15% of the country’s population has been served with water which does not comply with regulations set for effective dose.*
 - *Continue developing detection methods to be used and establish a leading lab in the country for continuation of establishing extensive database and ensuring quality of the database*
 - *Start information distribution for public*
 - *Possible amendment of current legislation*
- *No clear conclusions drawn how to carry on to solve current problems, systematic judgments needed to be prepared*



Where do we stand after the twinning project?

- *Thorough study of existing database carried out, possible correlations between radionuclides and other characteristic have been exposed*
- *General conclusions based on current database have been made*
- *Study of detection methods and suggestions for adapting them onto specific conditions in the country (total alfa-beta measurement versus specific radionuclide measurements, etc.) have been made*
- *A more detailed understanding have been reached on how to go on due to generalized information*
- *The results of the current twinning project can be regarded as a guideline for more concrete action plans for regulative institutions as well as for water distributors.*



How to carry on?

- **Keep a closer look on water purification pilot tests**
- **Begin purification investigations on existing filter systems to quantify and generalize their Ra-removal efficiencies.**
- **Continue studies on ^{210}Po and ^{210}Pb in ground waters in order to be able to conclude the magnitude of their contribution in the total effective dose**
- **Investigate consequences from Ra-purification systems, how possibly new problems emerge from Ra-concentration activities in the plant which needs to be licensed as radiation activity**
- **Concrete health risk investigations for specific cases in order to generalize judgments for the optimum effective dose levels in water and for optimum mitigation actions**