

Title of Research:

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Development of a user-friendly risk assessment tool for voluntary environmental risk assessment and management by business operators

Principal Investigator:

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Summary of Research:

Risk assessment and management of chemicals have become increasingly cumbersome due to reinforcements and revisions of national/international laws and regulations. For this reason, there is an urgent need for the implementation of accurate and simple risk assessment and management of chemicals. In order to address this need, we have focused on the improvement and enhancement of the Japanese version of the risk assessment tool, AIST-MeRAM 0.9.12 (released in Jul., 2013) during this project term, and eventually released its updated version, "AIST-MeRAM 1.0.1" in Dec., 2014 as a research outcome (Figure 1). At the same time, we have been also engaged in the development of the English version of the tool to promote international business operations of the Japanese chemical industry and its strategies for Asia, as well as to support the dissemination of risk assessment scheme described in Chemical Substances Control Law of Japan in Asian countries. The English version, "AIST-MeRAM 1.0.0", was also released in Dec., 2014 (Figure 1) as scheduled. In addition to these achievements, we have developed AIST-MeRAM web pages to encourage the use of these tools, lectured at the chemical risk forum hosted by Japan Chemical Industry Association, and conducted dissemination activities in Thailand, Vietnam, etc.

Major changes from the old version of AIST-MeRAM (Japanese version 0.9.12)		
Adding/updating data sources	Adding new built-in functions	Improving existing functions
<ul style="list-style-type: none"> • New data • ECETOC toxicity data (approx. 600 substances) • Toxicity data provided in Initial Risk Assessment Reports of NITE (approx. 150 substances) • Update data • Results of Eco-toxicity tests conducted by Min. of Environment, Japan (March 2014 version) • Emission factor data defined in Chemical Substances Control Law (CSCL) of Japan (November 2012 version) 	<ul style="list-style-type: none"> • Hazard assessment functions • Optional settings for toxicity data • Goodness of fit test for distribution (used for some of the statistical methods) • Automatic determination of uncertainty factors (UF) (Addition of REACH/OECD/TSCA methods) • Additional options for UF determination under CSCL (distinction between amine group or non-amine group) • Exposure assessment functions • No longer necessary to enter annual quantities of both manufacture and shipment (enter either of the quantity) • Registration of data sets (emission factors, use categories, etc.) for assessment in any other country • Expanded function for creation of exposure concentration distributions • Risk assessment functions • Automatic combination of risk assessment results (hazard + exposure) • Addition of concentration plots in risk assessment result sheets • Database initialization function 	<ul style="list-style-type: none"> • GUI improvements • Displaying a launch status dialogue • Additional description for kinds and number of data needed for hazard assessment • Clarification of assessment file name (addition of assessment method, CAS #, and name of substance to the file name) • Addition of main menu icons <ul style="list-style-type: none"> • Icon for changing assessment mode • Icon for importing external files • Additional description for risk characterization by MOE and EPAF • Increasing the frequency (default value) of bootstrap extractions for population-level assessment (100 times → 500 times) • Fixing bugs



Research outcome
Japanese version
AIST-MeRAM1.0.1



Research outcome
English version
AIST-MeRAM1.0.0



Outcome: AIST-MeRAM official websites

Japanese version URL: <http://meram.aist-riss.jp/>

English version URL: <http://en-meram.aist-riss.jp/>

Figure 1 List of major research achievements during the project term

Timeline:

From November, 2013 to February, 2015

Topics:

None

Publications:

- 1) (Presentation at domestic meeting) The 26th Annual Meeting of the Society for Risk Analysis Japan (Nov. 15-17, 2013), Chuo Univ., Korakuen Campus, "Development of a social need-oriented tool for ecological risk assessment and management, AIST-MeRAM".
- 2) (Invited speech at domestic workshop) NIAES 30th Anniversary Workshop: the 4th Agro-environmental Inventory Workshop, "Establishment of inventories for the efficient risk assessment of chemical substances, including pesticides". Feb. 27, 2014, Tsukuba International Congress Center (Epochal Tsukuba)
- 3) (Paper publication) Journal of Japan Society for Safety Engineering vol.53 No.2, 82-88, 2014, "Development of models for ecological risk assessment of chemicals and support practical use of the models in society".
- 4) (Presentation at international meeting) 2014 ISEH, 2014/7/1-6, Beijing China, "AIST-MeRAM: an easy-to-use tool for aquatic environmental risk assessment and management of chemicals".
- 5) (Presentation at international meeting) SETAC North America 35th Annual Meeting, 2014/11/9-13, Vancouver Canada, "AIST-MeRAM: an easy-to-use tool for aquatic environmental risk assessment and management of chemicals".
- 6) (Research outcome exhibition) AIST Techno-bridge Salon, Oct. 23-24, 2014, Tsukuba, "AIST-MeRAM: a tool for facilitating increasingly cumbersome tasks of risk assessment in the context of regulatory reinforcements".
- 7) (Invited speech at domestic forum) Chemical risk forum organized by Japan Chemical Industry Association, Jan. 30, 2015, Tokyo, "AIST-MeRAM, an all-in-one ecological risk assessment tool for complying the risk assessment procedures defined in Chemical Substance Control Law".