

Data Material for Analysis of Accidents with Vehicles and Machinery in Agriculture

Elisabeth Quendler
Veronika Helfensdörfer
Josef Boxberger





Universität für Bodenkultur Wien
Department für Nachhaltige
Agrarsysteme

Content

- Introduction
- Material and methods
- Results
- Conclusion



Situation, aim

Accident situation in Bavaria:

- agriculture frequently has accidents with agricultural vehicles, machinery and equipment
- percentage of fatal accidents far exceeds number of people working in this sector

Aim of study:

- to find, evaluate and analyse data sources and data
- to identify factors leading to accidents and probable links between these factors as well as to fill existing safety gaps

Material, accidents

Accident reports and databases:

Press reports of newspapers

Literature:

- European Statistics of Occupational Accidents (ESAW)
- 2006/42/EG EU-Machinery Directive and the
- norms and
- studies to accidents, regulations for safety and health prevention



Material

Registered accident reports (European Statistic Classification, literature) :
Landwirtschaftliche Berufsgenossenschaften in Bavaria : 755 of year 2008:
- description was shorter, recording in different forms

Three-year database based on registered reports: Landwirtschaftliche
Berufsgenossenschaften in Bavaria : 755 of year 2008,
2520 of period 2005 to 2007
- higher variable frequency than press reports

Press reports: 50 press reports, not available free of charge

Method, accidents

Selection criteria - reports: medium severe, severe and fatal accidents

- accidents with agricultural vehicles, machinery and equipment
- inability to work for more than three days and
- accident costs of more than € 2,500.

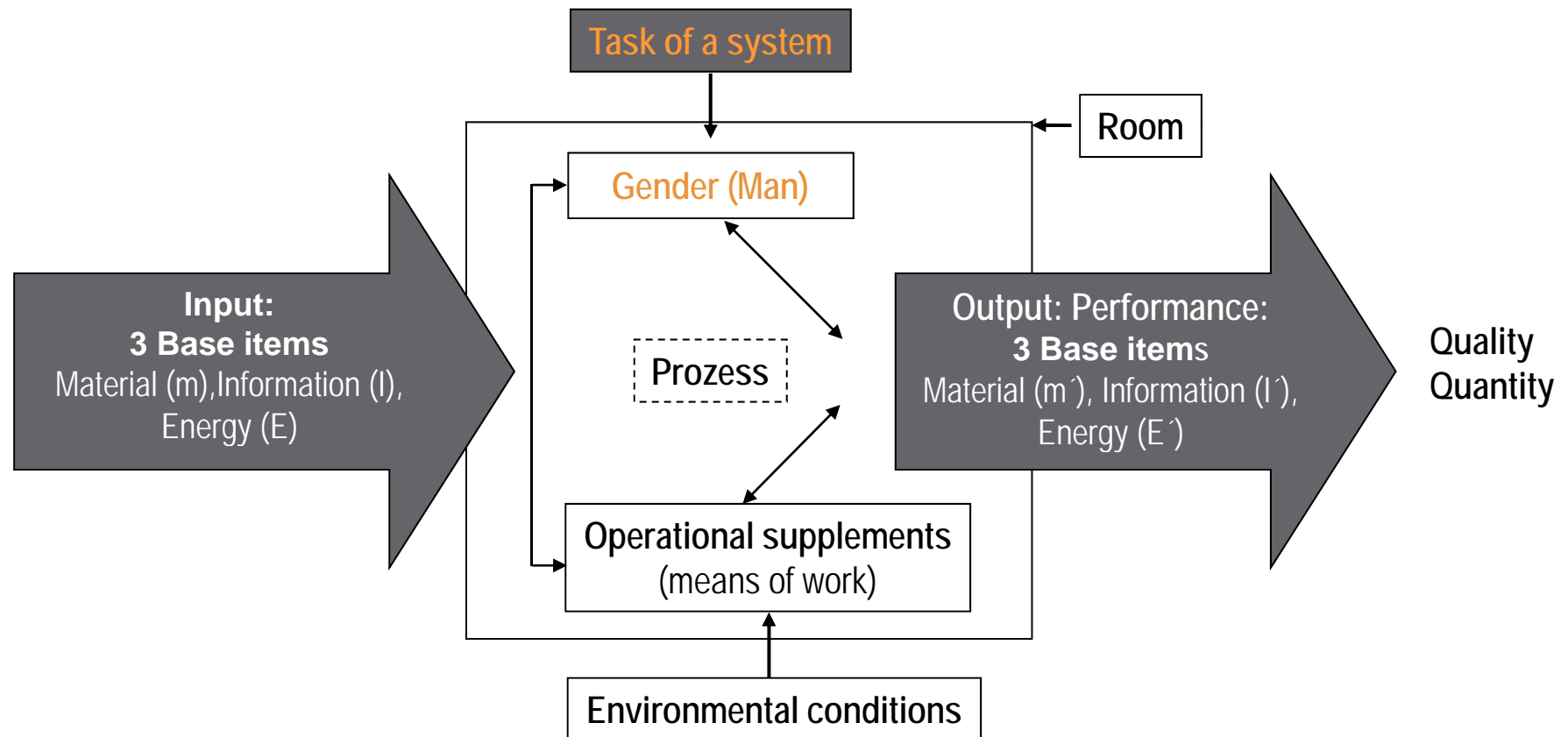
- data of sources was **evaluated** according to
 - **cause** of accident,
 - **course** of accident,
 - **context** of accident, and
 - **risk potential.**

- identification of accident **variables**
- data analysis: descriptive and statistical tests

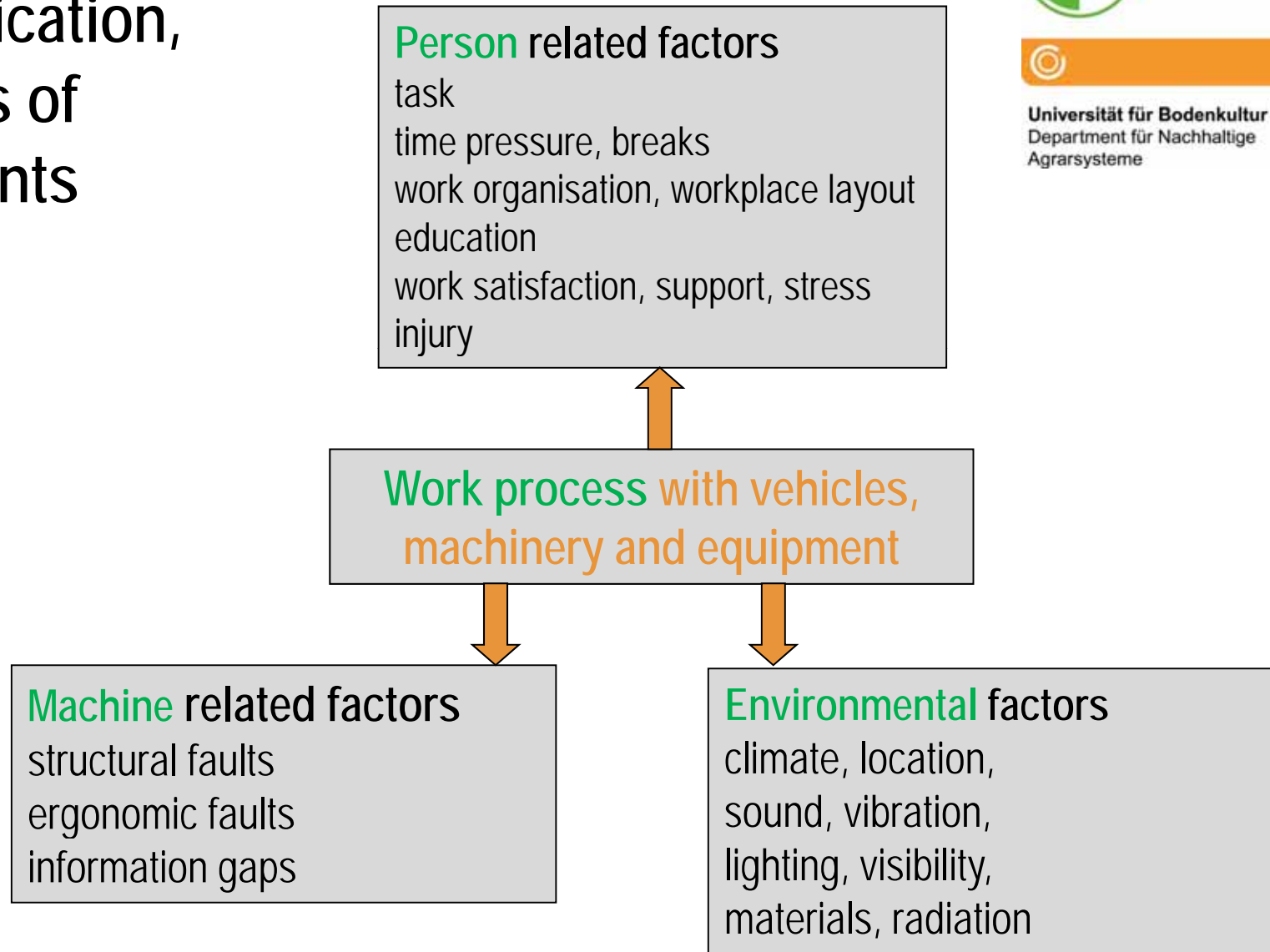
Working system model

(modif. nach Hammer, 1976)

Human-machine-environment system



Identification, causes of accidents



Variables, identified, recorded



Universität für Bodenkultur Wien

Feature group / variable	Accident reports	Database I	Database II	Press reports
Person / farm (sex, age, profession, occupation, employment status, family relations, farm size)	3+2(?)	5	2	5
Date of accident / report (date, time, place, country, district, machinery/ equipment, age of machinery, machine part, moving machinery part, accident object)	8	8	5	5+2(?)
Course of accident / work process (specific task, deviation (process part that caused injury), witness, influence human, machine, environment, error human, machine, environment (cause of accident), risks)	4 + 4(?)	5	3	1 + 4(?)
Injury (type, body parts, side of body, degree, result)	3	4	0	1+2(?)
Costs and law (immediate costs, machine directive, VSG, other regulations)	1(?)	1	1	1(?)
SUM	18 +8(?)	23	11	12+9(?)

Results, report analysis



Universität für Bodenkultur Wien
Department für Nachhaltige
Agrarsysteme

Results related to machinery type or groups based on accident reports:

- endangered sex and age groups
- locality, date and time information
- responsible work processes
- most often happened accidents
- most costly accidents (based on immediate accident costs)
- most medium severe, severe or fatal accidents

Results, report analysis

Registered accident reports:

mostly shorter description than in press reports

recording in different forms (harmonisation necessary)

missing:

- detailed information about work process and accident machinery (safety gaps, name of manufacturer, year of manufacture,..)
- human-machinery interaction responsible for accidents
- violation of existing law (not mentioned), total costs
- no risk analysis possible (based on available information)

Press reports: better understanding of accident circumstances (data base)

additional missing information:

- course of accident related to work process
- violation of existing law (partly)
- injury details
- costs

Results, measures



Universität für Bodenkultur Wien
Department für Nachhaltige
Agrarsysteme

Data analysis: Database I and created base of accident reports:

- higher variable frequency than press reports
- valid chi-square tests and logistical models according to machine type and – group: sample proved partly too small, creation of larger groups were necessary

Existence of information gaps

- similar results about information gaps in studies of Miller & Fragar (2006), Narasimhan et al. (2010), Lundberg et al. (2010)

Closing of information gaps, getting effective and efficient prevention:

- guided interviews with injured persons and experts
- discussion of worked out solution with body of experts

Conclusion

- Yearly many accidents are happen with machinery and equipement in Bavarian Agriculture
- 3 data sources were identified (accident and press reports, database)
- for reporting of accidents different forms used (harmonisation necessary)
- Recordable number of variables varies with documentation base and accuracy
- Important information gaps about human-machinery interaction during accidents
- Guided interviews with injured persons and body of experts (closing gaps, finding efficient and effective prevention measures)