Socio-Scientific Issues (SSI)

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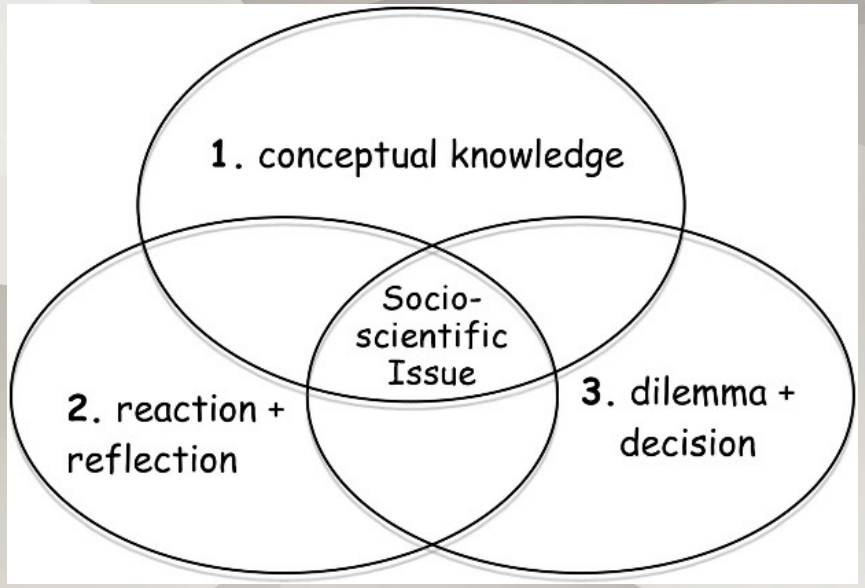
The Origin of Socio-scientific Issues (SSI)

- Interactions amongst social needs, scientific and technological developments.
- Human demands on an improved life, health, access to a secure food, energy supply and social or other means of communication.
- The debates about the risks to human health and the environment.
- Positive and negative effects of these developments on society.
- The need to decide about the appropriate use of science in society.

Definition of Socio-scientific Issues (SSI)

- An issue about which there is no one fixed or universally held point of view
- An issue often divides society, because different groups may offer conflicting explanations and solutions
- A combination of science and society



Key Features of SSI

- ill-structured problems/issues
- different key beliefs/understandings/values
- insufficient evidence
- a lack of a clear-ut solution
- a lack of consensus within the scientific community about the issue
- open-ended
- complex
- contentious dilemmas
- rational solutions derived from the underlying premises
- multiple dimensions
- Negotiaton
- SSI in context depends on culture, society, and national/societal characteristics

Dimensions of Socio-scientific Issues (SSI)

- economical,
- political,
- religious,
- ethical,
- environmental,
- health,
- scientific,
- technological,
- societal,
- moral

Common SSI handled in the relevant literature

- alternative medical treatment,
- Fossil fuels
- climate change/global warming,
- nuclear power plant,
- organic agriculture,
- Rainforest and biodiversity,
- hydroelectric power plant,
- overhead power lines,
- mass vaccination,
- Nutrition (e.g., dietary supplements, rice consumption, cooking oil, soft drink)
- tourism in historical place(s)
- Chemical in Medicine
- Food Additive
- Addictive

How are their controversy??

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- acid rain
- road salting,
- Tattoo
- mining (i.e., extracting gold with hydrogen ciyanide),
- adding supplemental chemical products into packaged foods,
- using naphthalene in toilet
- Coral reefs
- Volcanoes
- Medical use of alcohol
- Water resources
- Plastics
- Abuse of chemical substances
- Chemicals and environmental pollution

How are SSI differentiated?

1. Locality of SSI

SSI in context depend on culture, society, and national/societal

Global SSI

Local SSI

example??

2. Concept-focused of SSI

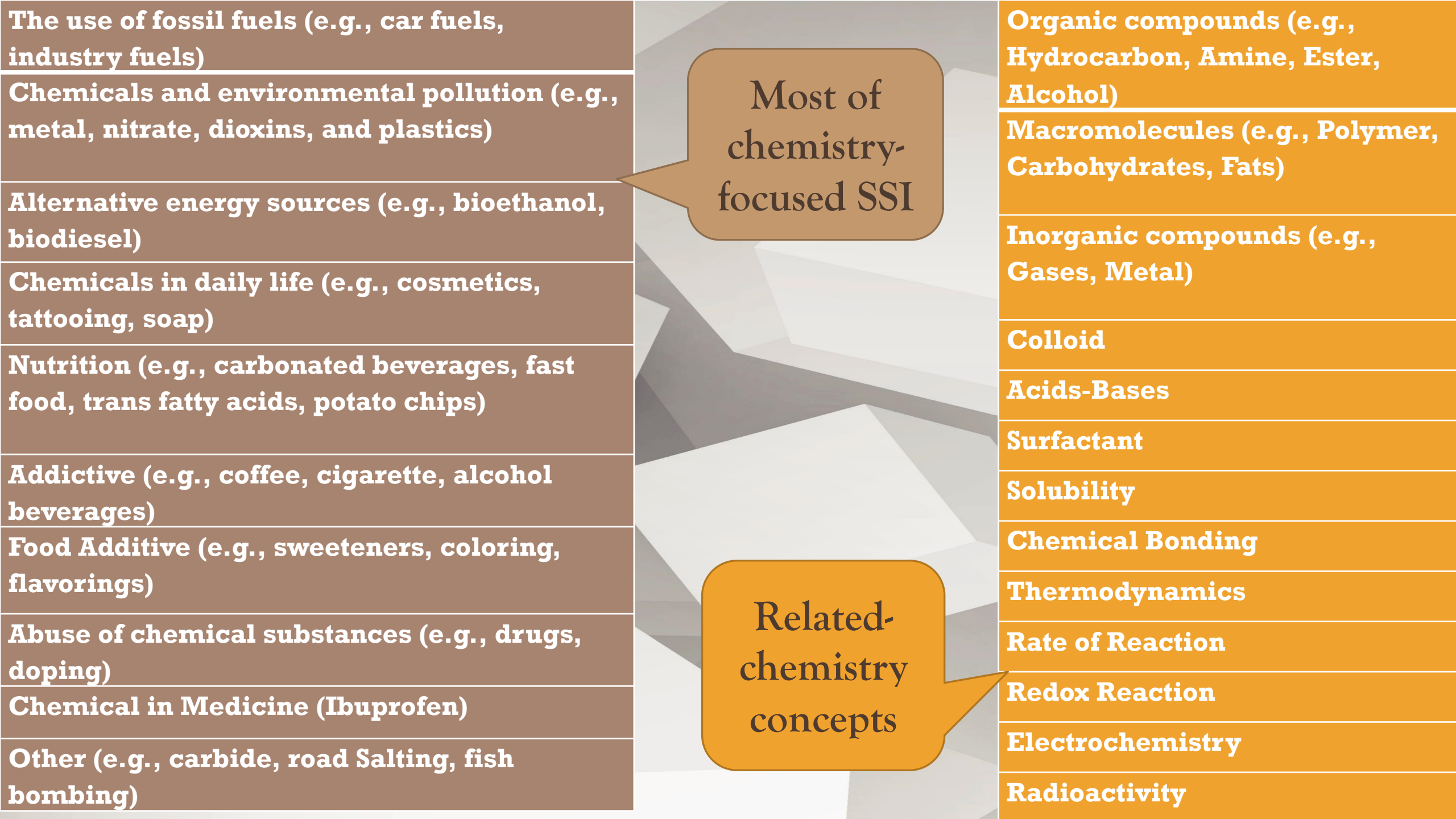
Chemistry-focused SSI (Çalık & Wiyarsi, 2021)

(1)directly employing chemistry as a driving factor for SSI;

(2)handling SSI within any chemistry-focused course(s) or chemistry topic(s) in an integrated science course(s) or science laboratory course(s) or Science, Technology, Engineering, and Mathematics (STEM) education;

(3)prioritizing the importance of chemistry in daily life through scientific/chemical literacy; and

(4)associating chemistry concepts with other related disciplines or concepts.


The use of fossil fuels (e.g., car fuels, industry fuels)
Chemicals and environmental pollution (e.g., metal, nitrate, dioxins, and plastics)
Alternative energy sources (e.g., bioethanol, biodiesel)
Chemicals in daily life (e.g., cosmetics, tattooing, soap)
Nutrition (e.g., carbonated beverages, fast food, trans fatty acids, potato chips)
Addictive (e.g., coffee, cigarette, alcohol beverages)
Food Additive (e.g., sweeteners, coloring, flavorings)
Abuse of chemical substances (e.g., drugs, doping)
Chemical in Medicine (Ibuprofen)
Other (e.g., carbide, road Salting, fish bombing)
Most of chemistry-focused SSI
Related-chemistry concepts
Organic compounds (e.g., Hydrocarbon, Amine, Ester, Alcohol)
Macromolecules (e.g., Polymer, Carbohydrates, Fats)
Inorganic compounds (e.g., Gases, Metal)
Colloid
Acids-Bases
Surfactant
Solubility
Chemical Bonding
Thermodynamics
Rate of Reaction
Redox Reaction
Electrochemistry
Radioactivity