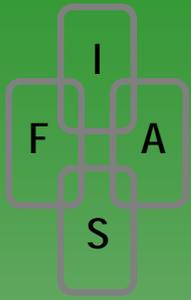
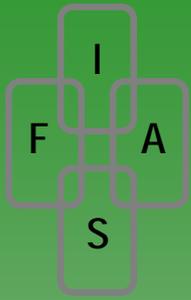


AN ISSUES LANDSCAPE FOR NANOTECHNOLOGY STANDARDS: Report of a Workshop

Institute for Food and Agricultural Standards
Michigan State University
East Lansing, MI 48824
USA
March 2007
Cowles House, 11-12 September 2006



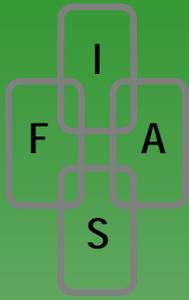
“This report ...informs the standards deliberations of agencies and organizations confronting emerging nanotechnologies...”



AT ISSUE

- Lessons for nanotechnology from the debate over agrifood biotechnology and genetically modified organisms





- Perceived failure to engage diverse stakeholders and other potentially affected groups in dialogue during standards development



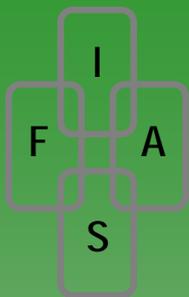
- Early dialogue among diverse interests should precede development of standards for nanotechnologies



- From dialogue, chart 'Issues Landscape' as roadmap to guide actions of all parties

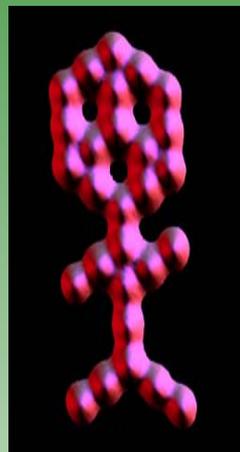


Why Standards?



Technical Compatibility

- Standards generally considered convenient, neutral, and benign means for handling technical compatibility



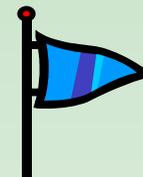
Social Power

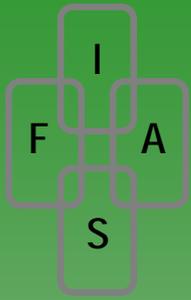
- Social power reflected in ability to set rules others must follow
- Standards represent form of codified power reflecting interests of groups with greatest access to and influence within standards setting processes

Whose Standards?

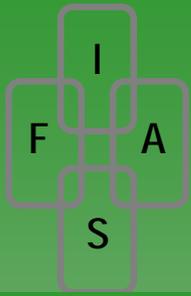
While many people and institutions recognize and broadly support role of standards in general, controversy often ensues as they confront the question:

‘Whose Standards?’





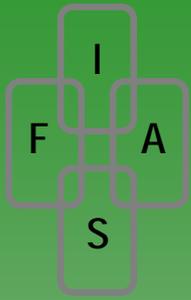
In the US context, the term standards is often applied to both voluntary standards set by various private or and non-profit organizations as well as to mandatory public regulations set by government agencies. In contrast, in the EU voluntary standards are usually contrasted with government regulations. However, in recent years, in part as a result of increased global trade, the distinction between standards and regulations has become blurred. Many nominally voluntary standards have become *de facto* mandatory. In this document we follow the US usage, and the usage employed during the workshop, distinguishing where necessary between voluntary and mandatory requirements.



Link diverse but often distinct
communities concerned with
nanotechnologies

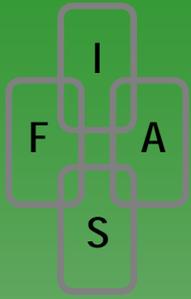


Stimulate public discussion
and understanding of issues
involved in developing
nanotechnology standards



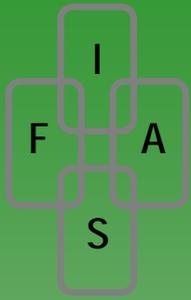
Participants and Process

- **Participants drawn from wide variety of domestic & international perspectives including:**
 - **Business & industry**
 - **Government regulatory agencies**
 - **Labor groups**
 - **Non-governmental organizations**
 - **Trade associations**
 - **Standards-setting bodies**
 - **Numerous academic and technical disciplines**



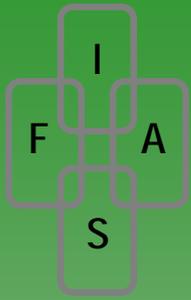
Participants and Process

- Convened pre-workshop web-forum to identify/discuss critical standards themes, shape workshop agenda to address participant needs
- Five Critical Standards Themes
 - Timing
 - Product versus Process
 - International Harmonization
 - Integration of Operational Standards
 - Participation and Transparency



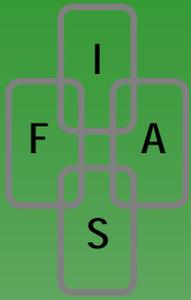
TIMING AND STANDARDS-SETTING

“Standards will need to be developed (early) for... nanotechnology research, production, products, and waste disposal.”



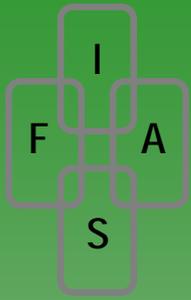
PRODUCT VERSUS PROCESS STANDARDS

“Addressing issues of risk will require thinking about standards in a manner that is much broader than risk assessment itself.”



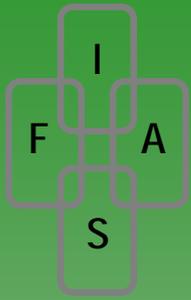
PRODUCT VERSUS PROCESS STANDARDS

“Decisions regarding whether to employ product or process standards may vary by sector of economic activity...”



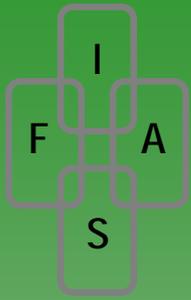
INTERNATIONAL HARMONIZATION

“Developing countries should have a say in international nanotechnology standards development...”



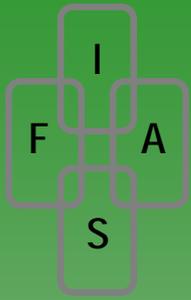
INTEGRATION OF OPERATIONAL STANDARDS

“Integration of diverse standards... is likely to pose new challenges for governmental regulation and non-governmental standards.”



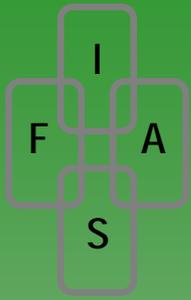
INTEGRATION OF OPERATIONAL STANDARDS

“Global integration will require cooperation among competing institutions.”



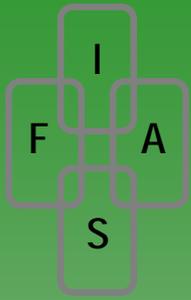
PARTICIPATION AND TRANSPARENCY

“There is a need to be sensitive to culturally appropriate forms of participation.”



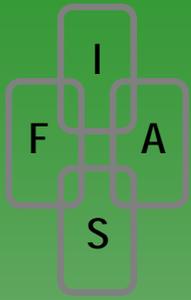
PARTICIPATION AND TRANSPARENCY

“Decision-makers... must remain open to being educated by participants about the social contexts of their concerns...”



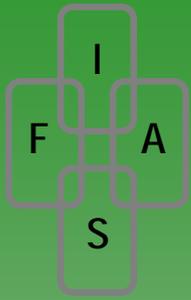
PARTICIPATION AND TRANSPARENCY

“There is a need to protect minority perspectives from a ‘tyranny of the masses,’ a social justice dimension that should not be overlooked.”



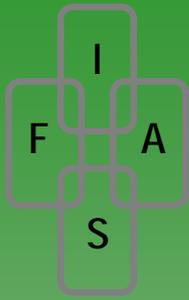
PARTICIPATION AND TRANSPARENCY

“Decision-makers... must remain open to **being educated** by participants about the **social contexts** of their concerns...”



NNI & Public Engagement

- Public Participation and Nanotechnology Workshop, Arlington, VA, May 2006
- 175 participants from government, industry, media, NGO, academia
 - Why do participation
 - Planning for participation
 - Engaging the public in science and education
 - Participation in action



TOWARD AN INTEGRATED APPROACH TO PUBLIC ENGAGEMENT IN AGRIFOOD NANOTECHNOLOGY

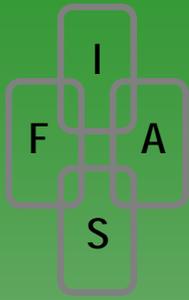
Dr. John V. Stone

Applied Anthropologist

Institute for Food And Agricultural Standards

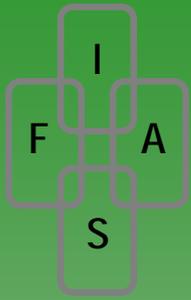
Michigan State University

Project on Societal Dimensions of Agrifood Nanotechnology



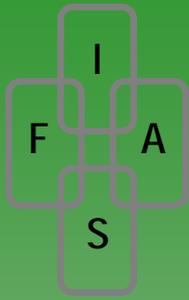
Outline of Integrated Model

- Extension as ‘participation platform’
 - Decentralized, Embedded, Experience, Rapport
 - **Connection to pre-existing local participatory processes**
- Citizens’ Schools of Nanotechnology
 - To build ‘nano- and ethno-literacy’ among Extension agents
- Ethnographic Risk Perception Mapping
 - To ethnographically assess and document key risk perceptions, impacts, mitigation data in ‘culturally responsive’ terms – familiar locations, social contexts
- ‘Material Safety Data Sheet’ as analogous reporting device
 - Analogous (familiar) mechanism for communicating key community RPM data upstream to decision-makers
 - Extension agents as ‘culture brokers’
 - Toward ‘Citizen Schools of Ethnography,’ Cultural Brokerage?



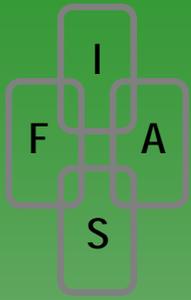
RPM Conceptual Background

- SIA literature: impacts occur to extent that people perceive themselves at risk
- Risk perceptions define community spatial, social, and behavioral characteristics
- Document key impact and mitigation issues raised by constituent populations
- Ethnographic (decentralized) approach to engagement
 - Access perception, impact, mitigation data in ‘culturally responsive’ terms – familiar locations, social contexts
 - LLRW and Dairy Farmers vs Milkshed; Amish and Cultural Dislocation
- Data fed back upstream to inform policy/decision-makers



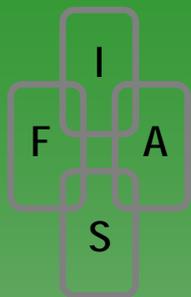
Key Concepts: Risk Perception Vectors

- Risk Perception Vectors
 - Pathways of perceived community impact, basis for dialogue
 - How will it ‘get [to] you,’ family, friends, co-workers, neighbors, social networks, etc.? (e.g., ‘fish consumption advisories,’ ‘milkshed,’ Amish and ‘cultural dislocation,’ ‘emerald ash borer’)
- RPM studies: at least four criteria (in addition to awareness) to address links between perceived risk, community social impact
 - Directness
 - Significance
 - Number
 - Duration
- ‘Controllability’ important aspect of each



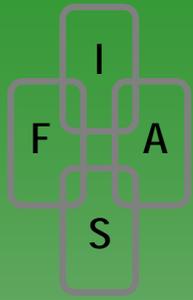
Challenges, Next Steps

- Need to be explicit about purpose, goals of process
 - To whom shall this information be sent, and to what end?
 - Lacking ‘decision structures’ for knowledge utilization – vital to **enroll decision-makers in design process**



More Challenges, Next Steps

- **Involve agents in design process** – as partners, bottom-up mandate
- Ethnographic training for agents
 - Toward a ‘citizen school’ approach to ethnography
 - Key example: Diane Austin, ‘Community-based Collaborative Team Ethnography: Community, University, Agency Partnership’ *Human Organization* 62(2), 2003
- Focus on specific vs. multiple application(s) of nanotech in food and agriculture
 - Pesticides, fertilizers, sensors, packaging, nutraceutical enhancement; plant, animal ag; aquaculture; etc.



More Challenges, Next Steps

- Evaluation and Accountability
 - Who gets the credit when things go well; who holds the bag when they don't?
 - How to determine (and who determines) success and failure? Toward a formative evaluation process...
 - Stay tuned...