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Exploring the Idea of Risk Management in Nanotechnology

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Abstract: *Together with risk management nanotechnology faces huge suspicions about hazards, welfares and possessions and in due course along with the application of nanotechnology. Since these indecisions, customary risk management moralities such as acceptable risk, cost-benefit analysis, and viability are unfeasible, as is the latest risk management value, the preventive principle. Yet, simply waiting for these suspicions to be fixed before job risk management exertions would not be sensible, in part because of the rising public anxieties about nanotechnology obsessed by risk insight heuristics such as move and accessibility. A more automatic, incremental, and helpful risk management method is essential, which not only will help accomplish evolving menaces from nanotechnology uses, but will also generate a original risk management exemplary for handling imminent emerging skills.*

Keywords: *risk management, nano technology, hazards, welfares*

INTRODUCTION

As nanotechnology has emerged from the laboratory into industrial production and profitable distribution, the possible for human and conservational acquaintance, and hence, risk, have developed a cumulative authenticity and precedence. In this, we emphasis on the well-being, security and ecological risks of nanotechnology relatively more than socio-economic or upcoming risks such as confidentiality, violence, and fiscal translation are discussed. As deliberated, the hitches in recognizing, never mind enumerating, the health, safety and ecological risks of nanotechnology are a major impairment to smearing outdated risk management methods to nanotechnology. Risk management of nanotechnology is more defied by the extensive range of skills and products covered within the term nanotechnology, together in terms of existing crops and claims and even more in relations of upcoming peers of products. The quick stride of growth of nanotechnologies, the trouble in major nanotechnology, and the

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considerable latent equalizing health and conservational welfares of some nanotechnology claims further confuse risk managing of nanotechnology. As a final point, risk management of nanotechnology must take into version public insights about the risks and welfares of nanotechnology and the rising public strains for controlling oversight.

This paper studies the applicability of customary risk supervision ideologies and new tactics grounded on the defensive principle to nanotechnology, and find these existing methods to be scarce and unfeasible. Nanotechnology will therefore necessitate and force the expansion of different risk management replicas.

PREVAILING RISK MANAGEMENT IDEOLOGIES

Together with customary risk management ideologies such as adequate risk, cost-benefit analysis, and the viability principle, beside with more recent inventions such as the protective opinion, are insufficient to meet the risk management trials accessible by nanotechnology.

CUSTOMARY RISK MANAGEMENT IDEOLOGIES

The collective customary prototypes for risk management of precarious mediators are (i) tolerable risk, (ii) cost-benefit exploration, and (iii) viability. Adequate risk methods trust on risk valuation to define the risks of a mediator, and then pursue to diminish hazards to heights that are informally suitable. Existing permissive of nanotechnology risks is too undefined to authority important risk charge, and is likely to continue so for some time. There are no recognized test methods or authenticated data that can be castoff to make systematically reliable measurable assessments of risk of explicit nanotechnology applications at this time.

Certain early animal studies have specified the latent for deadliness in at least some nano-materials, but these revisions are very initial including very high acquaintances that do not authorize human risk taxation. Furthermore, the early lessons give early signs of the possible difficulty of nanotechnology risk valuation. For example, diverse procedures of single-walled nanotubes existing extremely diverse risks liable on the industrial process and ability. The toxicity of nano-materials seems to be resolute by a multifaceted set of features, with size, surface area, chemical alignment, covering, shape, and route of exposure. Given this intricacy, extrapolation of toxicological things from other resources, comprising other nano-materials, is now defective, demanding hazards to be firm on a case-by-case origin. An overwhelming view has given the hundreds of nanotechnology products presently on the market and the thousands more to come. To conclude, suitable risk methods usually agonize from a organizational hindrance: by only seeing risks and their adequacy, they contempt other significant features such as the aids of the proficiency generating the risks and the expenses of dropping risks. As deliberated below, these factors are likely critical for socially ideal judgments around nanotechnology.

A second traditional risk management model is budget assistance investigation or harmonizing, in which the budgets and aids of proposed risk management options are balanced. Distinct suitable risk model, the budget assistance frame work has the benefit as both the assistances and risks of nanotechnology, which is vital, agreed that nanotechnology is expected to current both threats and aids for communal health and the atmosphere. However, the cost-benefit exemplary is ill-equipped for handling nanotechnology at this period, given the enormous suspicions about its menaces and welfares.

The massive sum and variety of latent nanotechnology submissions also make this method impractical - a global cost-benefit harmonizing for nanotechnology as a whole would mask the noteworthy cost-benefit discrepancy that likely exists between diverse claims. Otherwise, accomplishing discrete cost-benefit stabilities for each explicit nanotechnology claim would likely devastate existing risk management possessions given the large number of latent applications. While some qualitative evaluating of the perils and aids of nanotechnology may be a valuable employment for drives of rational around how those perils should be accomplished, cost-benefit inquiry does not offer a feasible risk supervision method for nanotechnology at this time.

The final customary risk management value is the probability or preeminent accessible expertise approach. This approach, which necessitates decline of risks to the final level technically or cautiously viable, has the gain of not demanding information about perils or aids. Certainly, the probability methodology has attained significant receipt amid executives in current years since it agrees evasion of disputes over risk exploration and barriers traditional to dropping perils to the range imaginable. Given the enormous uncertainties about nanotechnology risks, this method has some plea. The power of the viability method is also its key flaw, though, because, while disregarding risk evidence avoids discussion, it also avoids speaking what it truly vital, which is risk. The viability method thus may over-regulate or under-regulate risks reliant on whether the best accessible skill is essential or adequate to diminish offensive risks. This problem could be mainly difficult for a developing skill such as nanotechnology.

THE DEFENSIVE NORM

Many public notice collections and researchers have termed for the defensive norm to be practical to nanotechnology. The defensive norm, which has developed in current years as a substitute method to risk management, is often concise by the expression recovering benign than regretful. The defensive norm distinguishes that wellbeing and ecological choices often must be completed in the face of universal ambiguity, and so calls on result producers to err arranged the lateral of care by suspending new skills till their security can be sufficiently confirmed. This obligation is often enclosed in terms of instable the problem of resistant to the exponent of a skill to validate its

safety. Given the enormous doubt about nanotechnology risks, this skill might seem to be an ideal applicant for request of the defensive norm. However in detail nanotechnology intensely validates the boundaries of the norm as a decision-making tool; the defensive belief too is not a practical risk management exemplary for nanotechnology.

The first difficulty with the defensive norm is that it is also ailing distinct to aid as a choice making rule. While officials and supporters normally cite to the defensive belief, there is no typical manuscript for the principle, and the tons of designs that have been recommended fluctuate in vital esteems. Furthermore, no form of the defensive belief replies the precarious enquiries that need to be measured in stirring advancing with supervisory results, such as what equal or sort of indication is detriment is adequate to generate the belief, what significant and types of data must a producer harvest to content the belief, what equal of peril is suitable, and how would the welfares of a skill be evaluated beside it. Deprived of any principles or strategies to decide these inquiries, the defensive belief is disposed to to subjective and unreliable executive, if not utter disruption. Instances of such awkwardness comprise the appeal of the defensive belief to bar corn flecks improved with vital supplements, forbid energy drinks and discard food help comprising some inherently adapted corn in the dearth affected areas.

Some have recommended that the defensive belief makes the most intellect for caring against shattering perils that could forever abolish key parts of the human populace or the world's bionetwork. This dispute has been practical to nanotechnology. Observers have ventured that nanotechnology might be used to mature hordes of self-replicating nano bots that might extinguish the earth, frequently denoted to as the old sludge set-up. Smearing the protective belief to this option, the dispute goes that no sum of probable welfares from nanotechnology would validate supposing a peril of such a shattering significance.

CONCLUSION

Nanotechnology grants massive challenges to risk management, and prevailing risk replicas will not be up to the task. Extra incremental, ideal values are needed for nanotechnology. The effective expansion of such an original risk executive method would not only enable the accountable expansion of nanotechnology, but will generate a new model that might be used for extra evolving skills of the imminent. For instance, seeing to the past, a prototypical comparable to that projected now might have aided even the overview of hereditarily adapted foods. As we gaze to other expertise revolts impending in the upcoming, counting evolving expansions in telecommunication skills, scrutiny skills, hereditary improvement, intellectual disciplines, and many others, the need to mature new, better replicas for risk management converts all the more vital.

References

Colvin, V.L. (2003), "The potential environmental impact of engineered nano-materials", *Nature Biotechnology*, 21, pp. 1166-1170.

Sweet, L. & Strohm, B. (2006), "Nanotechnology-life-cycle risk management", *Human & Ecological Risk Assessment*, 12, pp. 528-551.

Nel, A., Xia, T., M@dler,L. & Li, N. (2006), "Toxic potential of materials at the nano-level", *Science*, 311, pp. 622-627.

Florini, K., Walsh, S., Balbus, J.M. & Denison, R.(2006), "Nanotechnology: getting it right the first time", *Nanotechnology Law & Business*, 3, pp. 39-53.

Gwinn, M.R. & Vallyathan, V. (2006), "Nanoparticles: health effects -pros and cons", *Environmental Health Perspectives*, 114, pp.1818-1825.

Shapiro, S.A. & McGarity, T.O. (1991), "Not so paradoxical: the rationale for technology-based regulation", *Duke Law Journal*, 1991, pp.729-752.

Sunstein, C.R (1991), "Administrative substance", *Duke Law Journal*, 1991, pp.607-646.

Gary E. Marchant, Douglas J. Sylvester, and Kenneth W. Abbott, "Risk Management Principles", Sandra Day O'Connor College of Law, pp. 1-54.

Lin-Easton, P.C. (2001), "It's time for environmentalists to think small - real small: a call for the involvement of environmental lawyers in developing precautionary policies for molecular nanotechnology", Georgetown Int'l Environmental Law Review, 14, pp. 106-134.

Sandin, P. (1999), "Dimensions of the precautionary principle", *Human & Ecological Risk Assessment*, 5, pp. 889-907.

Marchant, G.E. (2003), "From general policy to legal rule: the aspirations and limitations of the precautionary principle", *Environmental Health Perspectives*, 111, pp. 1799-1803.