

# Environmental Concerns and Sociological Issues



# Environmental Impacts

- Many States require an environmental impact statement for any large undertaking that may change the environment.
- One of the more complete environmental impact studies was carried out by the Bureau of Reclamation for Project Skywater and completed in 1977.
- The study examined number of possible effects and a draft of the document was circulated to a number of organizations for additional comments.

# Effects of Silver Iodide

- Silver iodide, like most silver compounds, tends to be insoluble in water.
  - Therefore, it is difficult to get silver iodide into the food chain or to get it absorbed into any living organism.
- The quantity of AgI released is also quite small relative to the area; hence, the effects on the environment are small.



# Effects on Vegetation and Animals

- Project Skywater looked at the additional moisture on the natural vegetation.
  - Different areas were affected differently, but the effects on the short term were small.
- The effects on animal life were less pronounced, but there would be changes possible, largely as a result of the vegetation changes.
  - Effects tend to be a long term effect and not noticeable on the short term.

# Erosion and Adverse Effects

- Additional precipitation would result in additional runoff, especially in the case of winter programs.
  - The additional runoff would cause more erosion, especially in mountainous terrain.
  - Result in enhancement of an ongoing process.
- Some people will benefit more than others and some may find weather modification undesirable.
  - Some examples are snow removal, loggers, and recreational industries.

# Sociological Issues

- Point of Discussion, Debate, or Dispute
- Matter of Wide Public Concern
  - Issues can blossom into problems.
  - For example, arguments, controversy, or fears.



Picture of presenters at the Conference on Prediction and Countermeasures of Climate Change on 29 October 2019 in Seoul, South Korea

# **The Public:**

## **Not one Group with Common Interests**

- Many groups of people with varying concerns (self, others), ideologies (progressive, conservative), needs and perceptions.
- Can be misinformed, driven by emotions and fears.
- Certain Groups or people can be very influential.

# Fears of Weather Modification

- Economic Dis-benefit
- Life Threatening Developments
- Others Will Benefit and I Won't
- Loss of Civil Liberties
- Irreversible Environmental Impacts
- Divine Retribution





# Basis of Fears

- Most fears based on misconceptions
  - How the atmosphere works.
  - Toxicity of AgI.
  - Extent of possible effects.
- Uncertainty
  - How well does it work?
  - What might be done with the technology?
- Much is based on early optimism of the potential to modify the atmosphere.



Experience of Cloud Seeding in Mali, West Africa

# **Social Concerns Encountered**

- Mistrust of Government
- Who Owns the Atmosphere?
- Should Weather Modification be a Viable Weapon?
- Who is Liable for Negative Outcomes and Damages?
- Should there be Stringent Regulation?
- Need for Rigid Proof verse Preponderance of Evidence
- What is the Role of Evaluation
  - Transparency and Information are Critical!!

# Public Opinion

- Public is confused about weather modification – why?
  - Simultaneous research and operations.
  - Needs for weather modification aren't uniform.
    - Need for evaluation is critical
- Public Views
  - About one-third of people oppose for religious or natural beliefs.
  - Most people are lukewarm.
  - Public (or individual) perception rules.

# Evaluation of Weather Modification

- Small changes are not obvious.
- Payers need to know if getting money's worth.
- Who does the evaluation is important.
- Evaluation is key to maintaining programs.
  - There are winners and losers on all projects!



# Factors for Deciding on Program

- Safeguards
- Local Economic Benefit
- Scientific Evidence
- Cost-effectiveness
- Emergency Conditions
- Dis-benefit Compensation
- Public Communication



Picture of presenters at the 2019 International Conference for Fine Dust in Seoul, South Korea.