Project Scoping Worksheet

Created: August 7, 2024

1. Project Title: Biodiversity Analysis and Conservation

2. Problem Description

- **What is the business or policy problem you are facing?**

Answer:
The loss of biodiversity in various national parks, leading to ecological imbalance and the potential extinction of species.

- **Who or what is affected by this problem?**

Answer:
The problem affects various species of animals and plants in the national parks, the ecosystems, and the local human communities dependent on these ecosystems.

- **How many of these people/organizations/places/etc. are affected by the problem, and how much are they affected (order of magnitude is fine)?**

Answer:
Approximately 20% of the species in the studied parks are facing conservation issues. The parks and surrounding areas, which span thousands of square kilometers, are impacted by the loss of biodiversity.

- **Why is solving this problem a priority for your organization now?**

Answer:
Immediate action is required to prevent further loss of biodiversity, which can lead to irreversible damage to ecosystems and the services they provide. Conservation efforts now can help preserve species and habitats for future generations.

- **How have you tried tackling this problem and what has been the outcome of your efforts?**

Answer:
Previous efforts include monitoring species populations and implementing conservation measures, but these have been insufficient due to limited data and resources.

- **What other groups or stakeholders in your organization and outside need to be involved in scoping and implementing this project?**

Answer:
- Park management authorities
- Environmental NGOs
- Local communities
- Government wildlife and conservation departments
- Academic and research institution

3. Goals:

- **What are your social, policy, or business goals, and what constraints do you have?**

Answer:

- Increase species diversity in national parks (Effectiveness)
- Restore degraded habitats (Effectiveness)
- Raise awareness and educate local communities (Equity)

Constraints Around This Goal:

- Limited budget and resources
- Need for ongoing collaboration with multiple stakeholders
- Legal restrictions regarding conservation activities

Listing goals below in order of priority.

	Goal	Goal Type (Efficiency, Effectiveness, or Equity)	Constraints Around This Goal
1	Increase species diversity in national parks	Effectiveness	Limited budget and resources, need for ongoing collaboration with multiple stakeholders
2	Restore degraded habitats	Effectiveness	Limited budget and resources, need for ongoing collaboration with multiple stakeholders, legal restrictions regarding conservation activities
3	Raise awareness and educate local communities	Equity	Limited budget and resources, need for ongoing collaboration with multiple stakeholders

- **What trade-offs exist across these goals?**

Answer:

- Balancing between immediate conservation actions and long-term habitat restoration
- Allocation of limited resources between species monitoring and community education programs.

4. Actions:

- **What actions will organization take to address the problem?**

Action	Goal	Who is Executing	Being Taken On	Frequency	Channels	Resource Constraints	Ethical Issues	Additional Information
Habitat restoration	Restore degraded habitats	Park rangers	Degraded areas within parks	Quarterly	On-site	Limited manpower and funding	Impact on existing ecosystems	Permits required, long-term monitoring needed
Species monitoring	Increase species diversity	Wildlife biologists	Endangered species	Monthly	On-site, digital	Limited number of biologists	Disturbance to wildlife	Use of non-invasive monitoring methods
Community education programs	Raise awareness and educate community	Environmental educators	Local communities	Bi-monthly	In-person, online	Limited participation, resources	Cultural sensitivity	Collaboration with local schools

5. Data:

- **What data sources do we have internally?**

Data source	Contents	Granularity	History	Frequency	Identifiers	Owner	Storage	Ethical Issues	Additional information
Species Info	Species names, conservation status	Species level	10 years	Annually	Scientific name	CodeAcademy	Database	Consent from original data collectors	Collection biases possible
Observations	Observations count, location, date	Observation level	5 years	Monthly	Observation ID, scientific name	CodeAcademy	Database	Privacy of observation locations	None

- **What data can we get from external private or public sources?**

Data source	Contents	Granularity	Frequency	Identifiers	Owner	Storage	Ethical Issues	Additional information
Environmental	Air and water quality data	Park level	Daily	Sensor ID	NOAA	API	Consent from data providers	Access permissions needed
Census Data	Demographic information of local communities	Community level	Annually	Census block	US Census Bureau	Database	Privacy concerns	Use for community education programs

- **In an ideal world, what additional data would you want to have that is relevant to this problem?**
  - Real-time monitoring data of species movements (GPS tracking)
  - Detailed habitat condition assessments
  - Comprehensive data on local climate patterns

6. Analysis:

- **What analyses will you complete to inform your actions?**

Analysis	***Type***	***Purpose***	***Informing Action***	***Validation***	***Ethical Issues***
Species Status	*Description*	*Understand historical trends in species status*	*Species monitoring*	*Historical data comparison, precision metrics*	*Data privacy for species locations*
Habitat Quality	*Prediction*	*Predict areas most in need of restoration*	*Habitat restoration*	*Historical data, field trials*	*Impact on existing ecosystems*
Community Impact	*Causal Inference*	*Assess impact of education programs on conservation efforts*	*Community education programs*	*Surveys, community feedback*	*Cultural sensitivity*

7. Ethical Considerations:

- **Privacy, Confidentiality, and Security:**
  Ensure all data collected is anonymized and stored securely. Consent must be obtained for any personal or sensitive data used.

- **Transparency:**
  Inform all stakeholders, including park authorities and local communities, about the project's goals, methods, and findings.

- **Discrimination/Equity:**
  Ensure equitable treatment of all species and communities involved in the project. Address any potential biases in data collection and analysis.

- **Social License:**
  Engage with local communities to ensure their support and address any concerns they may have. Be prepared to justify the project publicly.

- **Accountability:**
  Designate responsible parties for each ethical consideration, including data security and community engagement.

- **Are there any other ethical considerations that should be made prior to or during the data science project?**
  - Obtain necessary legal permissions for data collection and use
  - Ensure all actions comply with local and international conservation laws