

WE CHALLENGE YOU TO CREATE:

PROJECT MODELS AND APPROACHES FOR CITIZEN SCIENCE IN PUERTO RICO (CONTRIBUTORY, COLLABORATIVE, CO-CREATIVE)

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para la Naturaleza

33% OF PUERTO RICO'S LANDS BY 2033

The Conservation Trust of Puerto Rico (CTPR) has adopted the citizen science model of the Center for Advanced Informal Science Education (CAISE) as a tool to obtain their goal of protecting 33% of Puerto Rico's lands by 2033. Based on lessons learned from a prior NSF grant, CTPR is engaging underserved and underrepresented Hispanic citizens living within the Río Grande de Manatí watershed in the discovery and exploration of its natural resources.

Our goal is to take project participants through three phases of informal science education (ISE): participatory, collaborative and co-creative, (Bonney et al, 2009), by means of five ecological studies that address issues relevant to their everyday lives and to the management of natural resources.

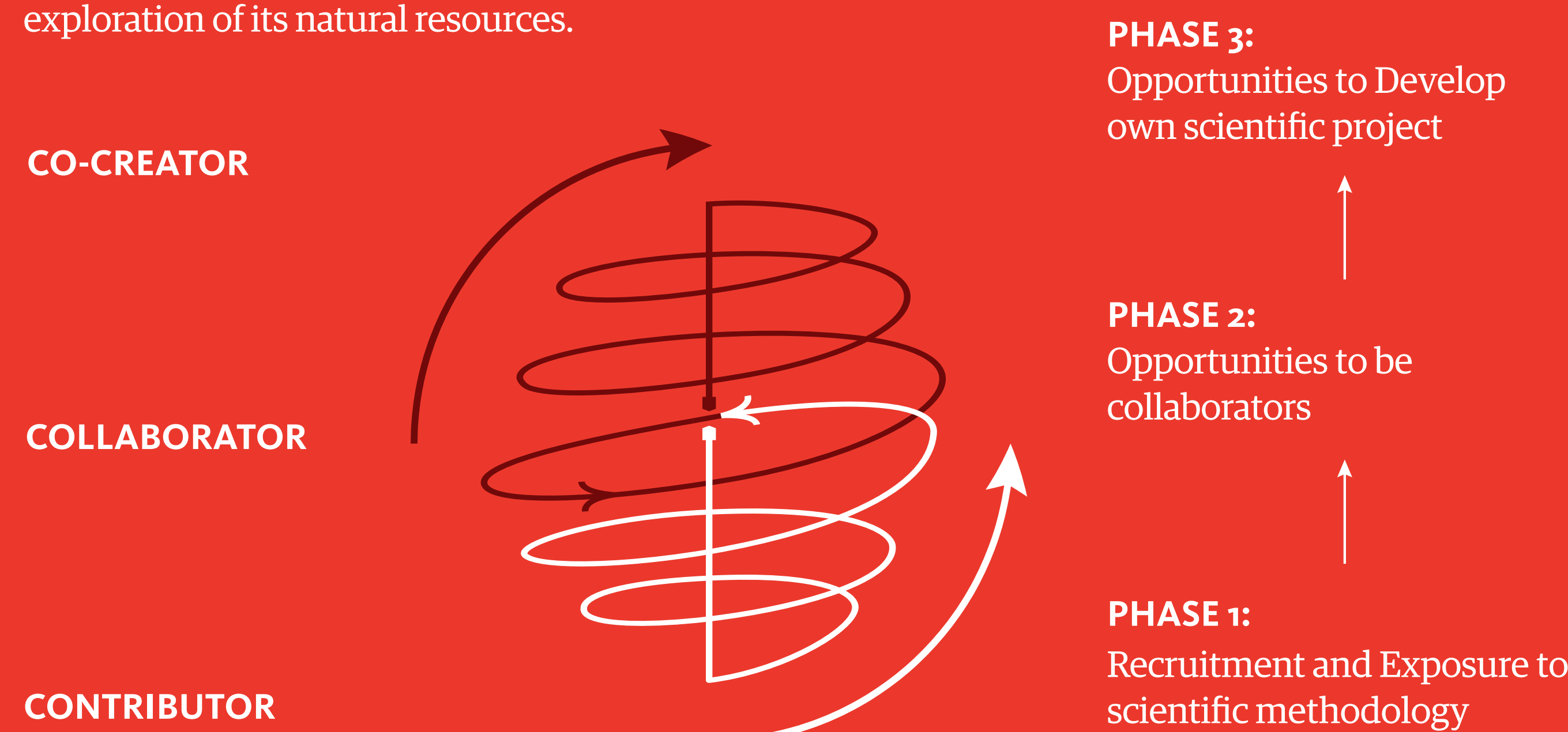


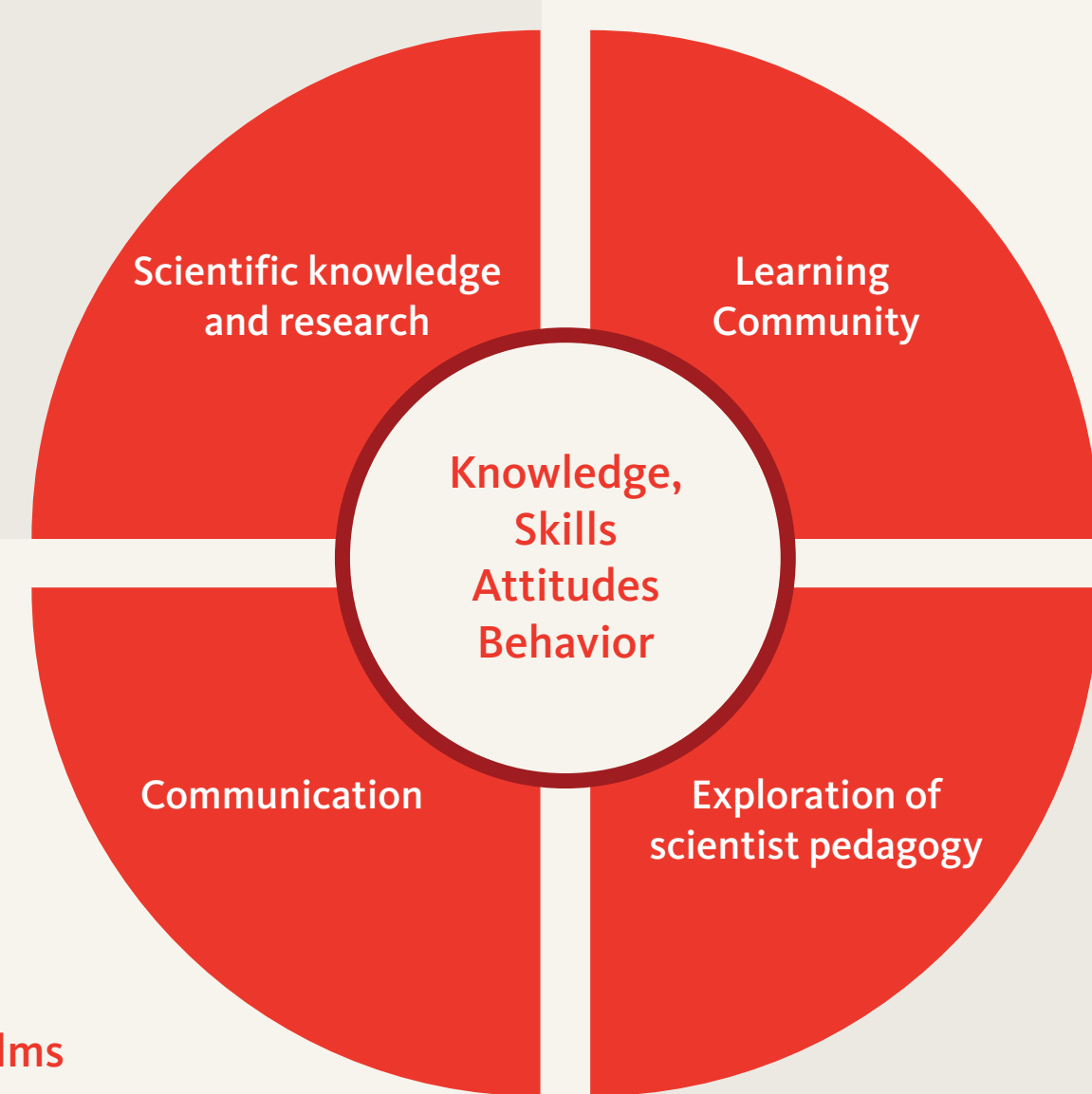
Figure 2: Proposed ISE Explanatory Model for NSF award (122382)

PROJECT GOALS AND RESEARCH QUESTIONS

OBJECTIVE 1:

To study if the proposed ISE model generates a gain in knowledge and skills, and change in attitude and behavior in participants to become co-creative citizen scientists.

- Workshops in scientific content and research methodology
- Five site research projects describing details on how science can be applied to address relevant community environmental issues
- Workshops for community building
- Researchers Meetings Participatory endeavor



- Bulletin, Films
- Field guides
- Website
- Presentations
- Participation in National and International Summits
- Publishing in peer reviewed journals
- Documentary videos
- Meetings
- Content outcomes

Figure 3: Proposed ISE Model integrating lessons learned from prior NSF award (0638966)

OBJECTIVE 2:

To explore STEM pedagogy with Hispanic populations in ISE settings, including how scientists' behavior and communication shift according to participant profile and environment settings; scientists' gain from the ISE experience; and scientists' commitment to further advance ISE.

ORGANIZATIONAL STRUCTURE

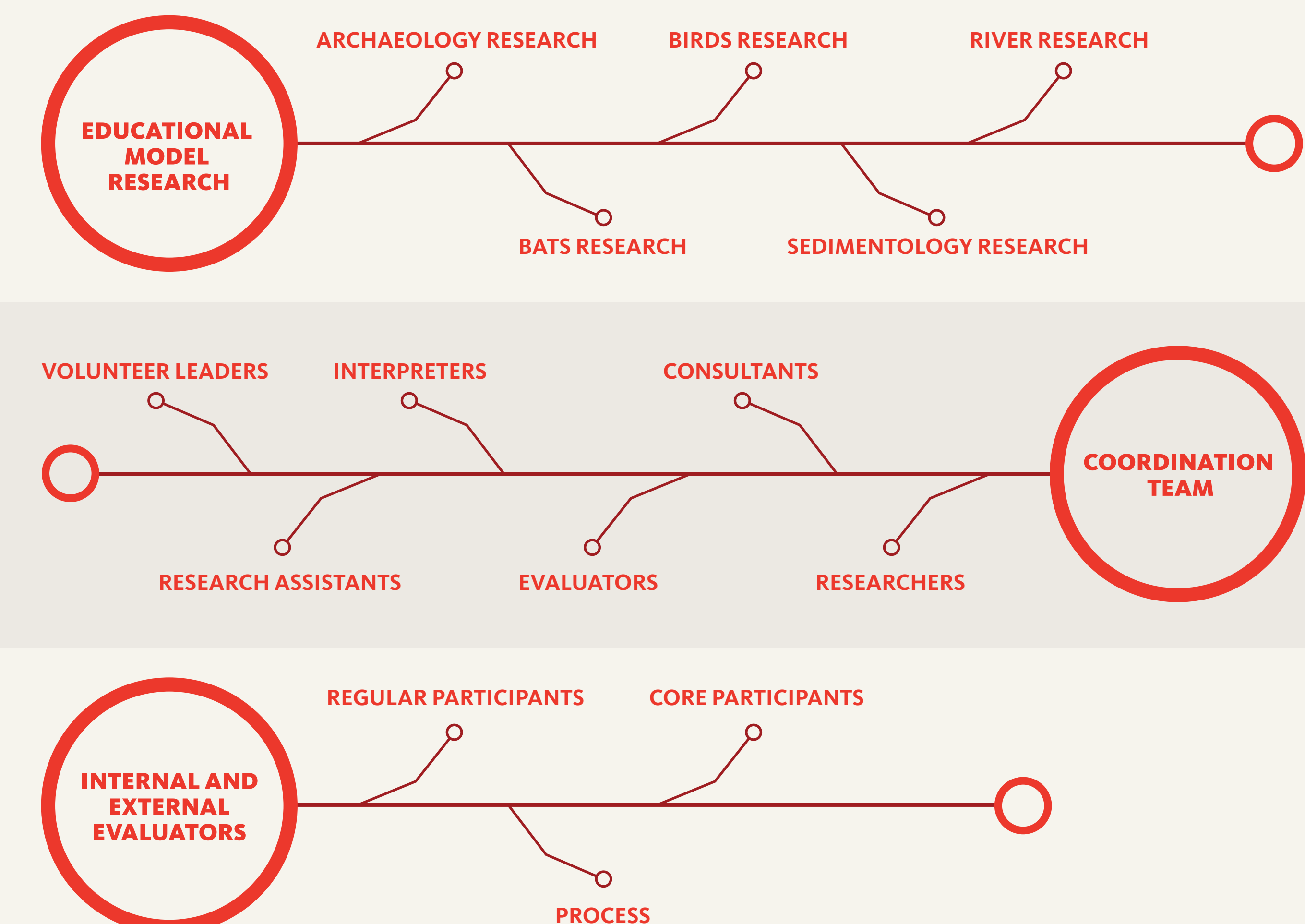


TABLE 1:

Total number of questionnaires to evaluate knowledge, skills and attitude towards science completed within the different themes

THEME	NUMBER OF FORMS EVALUATED
Rivers	59
Sedimentology	68
Bats	126
Birds and forests	67
Archaeology	70
Total	390

TABLE 2:

Participants' self-assessments by topic

THEME	NUMBER OF FORMS EVALUATED
Rivers	50
Sedimentology	144
Bats	138
Birds and forests	147
Archaeology	120
Total	599

PRELIMINARY FINDINGS

QUESTIONNAIRES

- 75% had little or no prior knowledge or skills
- 75% were confident to talk about the theme they participated
- 54% to 63% of participants were able to describe the scientific process, but only a limited number were able to describe the scientific process in logical order

SELF ASSESSMENT

- 80-100% were able to understand and resume research main idea
- 90% felt their participation was significant
- 78%-95% stated they learned new ideas

FORMATIVE ASSESSMENT

This project has developed tools and instruments that evaluate ISE at both teaching and learning levels, in an informal setting, to Hispanic audiences. CTPR is identifying and documenting the key roles of the various participants within this ISE model.

STRENGTHS

- Motivated and passionate
- High level of engagement
- Actively supporting participants (asking questions, data collection, engaging participants in process)
- Take ownership
- Strong alignment between facilitators creating a collaborative atmosphere
- Logistics were very well handled

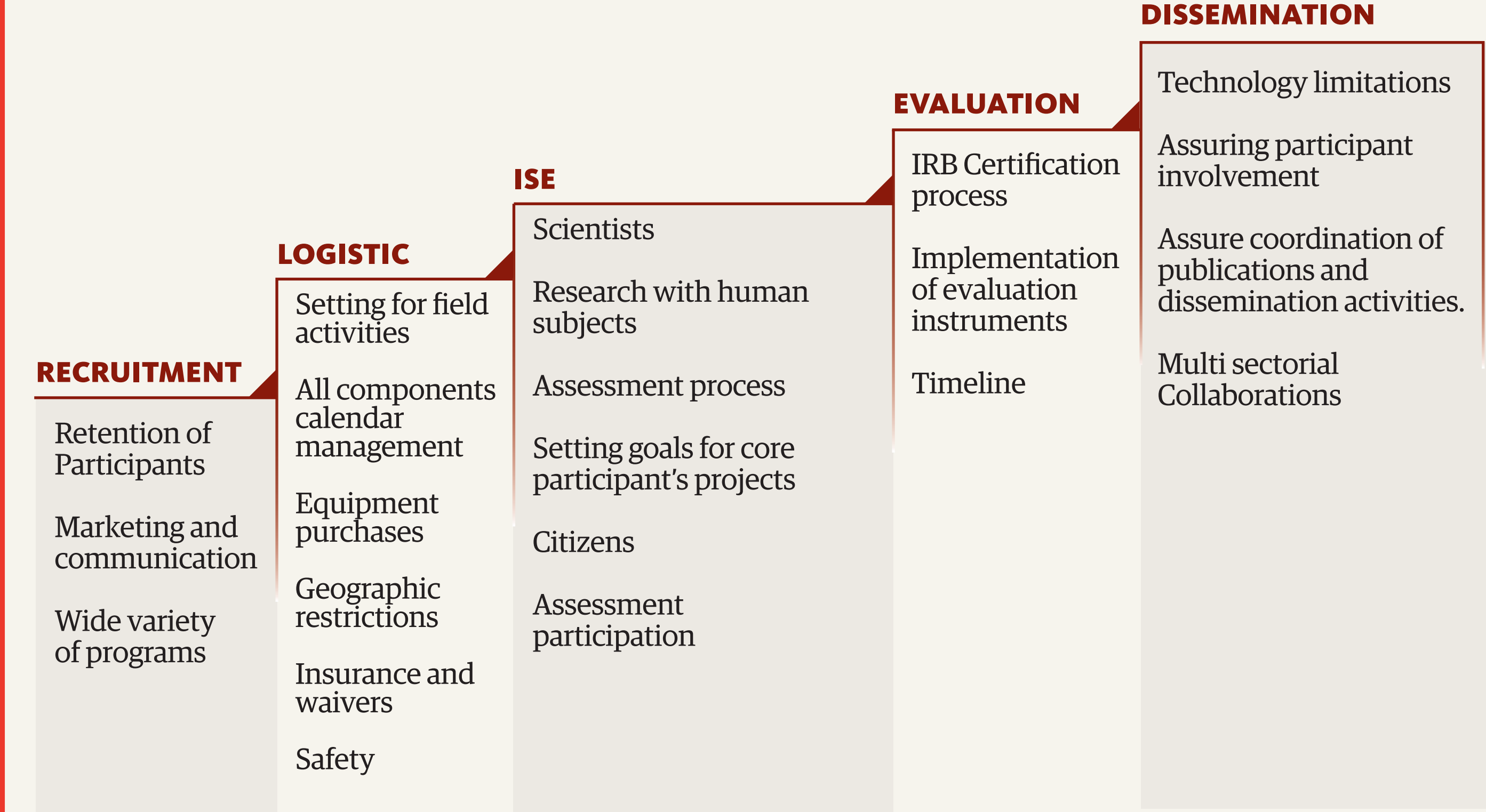
TARGET AREAS THAT NEED MORE WORK

- Participants:**
 - Overall purpose of research project in relation to Citizen
 - Science was inconsistent throughout the projects
 - Facilitators were inconsistent in explaining the overall goal of the project.
- Facilitators (researchers, assistants and interpreters):**
 - Participant's knowledge gap
 - Recruitment and sustaining participation
 - Program logistics (paperwork) (but participants did not express concern)

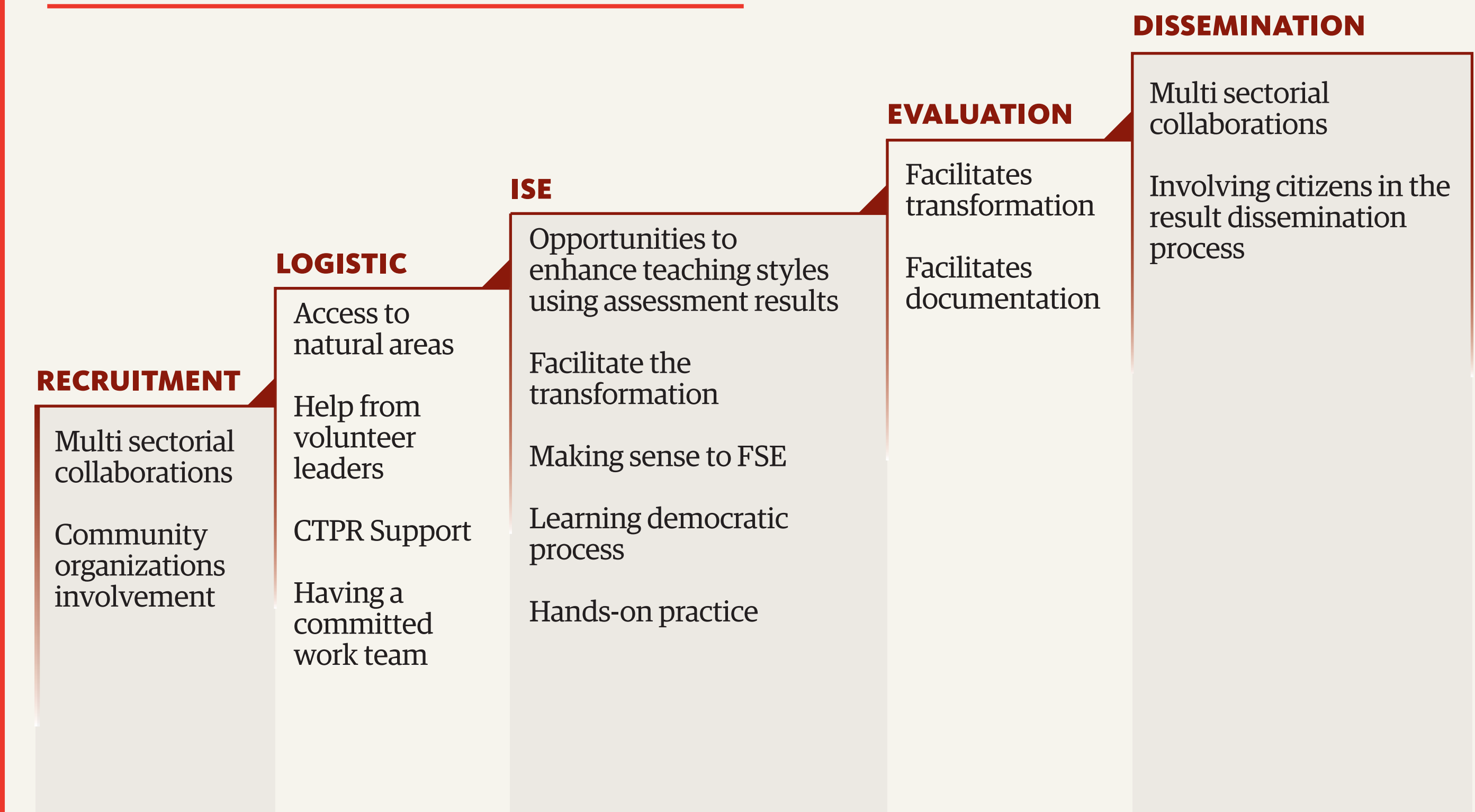
STAFF AND VOLUNTEERS PHOTOS



CHALLENGES ON THIS CITIZEN SCIENCE PROJECT



ACHIEVEMENTS ON THIS CITIZEN SCIENCE PROJECT



RECOMMENDATIONS

- Regular meetings focused on topics for reflection and to make on going adjustments
- Consider a work plan of marketing, recruitment and address items within team control
- Assure communication about what is the Citizen Science Project among all researchers
- Be very explicit about the goals
- Have formal introduction and formal conclusion to each activity

LITERATURE CITED

- Bonney et al, (2009). Public Participation in Science Research, Defining the field and assessing its potential in informal Science education. A CAISE Enquiry Report. Washington DC.
- Estremera Ruben, (2014) external report to CTPR on process of learning in informal setting
- Muniz, Carlos and Lopez, Annett, 2014 External report on process of teaching in informal setting
- Census data 2012
- Randi Korn & Associates 2014: External Evaluation report for CTPR

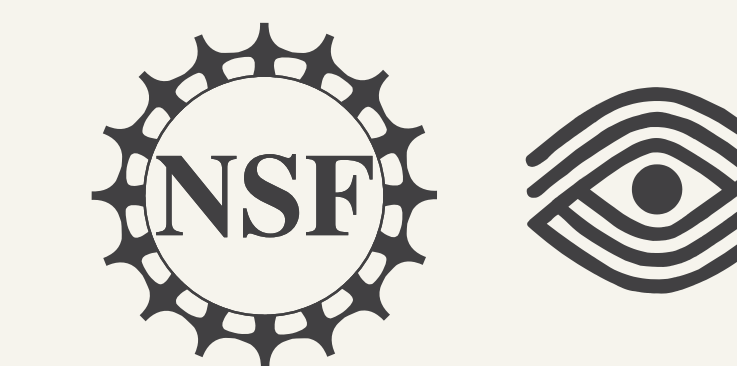
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