Appendix 2: 540 questions and responses resulting from the question collection survey.

1. What steps will result in incorporation of market externalities without causing large negative impacts on significant segments (e.g. low-income) of society?
2. How do power dynamics and differentials within social systems affect CNH dynamics?
3. How does culture motivate or demotivate humans in protecting their natural environments?
4. Why to people ignore what's in their best interest even when they know?
5. What are the sources of resilience in both social-cultural systems and among non-human actors in the ecosystem?
6. How do we account for spatial autocorrelation and distance relationships in these systems?
7. How do we determine the boundaries of coupled human and natural systems as we study them? LCA has some standards - we should too.
8. What role does human decision-making play in CHANS dynamics?
9. How does one promote human awareness of the CNH basis for human livelihoods?
10. What are the most effective ways to communicate and/or implement interventions in CHANS?
11. How can humans best adapt to anthropogenic climate change?
12. what quantifiable impacts on natural systems do human activities have?
13. Do humans respond similarly to general classes of ecological processes (e.g. linear, non-linear, slow, fast, threshold) despite local context (ecological, political, socio-economic)? Search for general CHANS principles
14. what are the tipping points, for ecosystems and social systems, under increasing pressure from climate change?
15. What influences (human) behaviour *change*?
16. How are sustainability and peace linked? Can conservation and other sustainability efforts, as well as CHANS research help promote peace, conflict resolution?
17. What is the most effective way to get managers and policy makers involved in coupled systems research?
18. How to balance ever increasing natural resource needs of communities keeping in mind the needs of wildlife?
19. How can social and natural sciences be integrated to best illuminate coupled human and natural systems?
20. How can we link landscape ecology and life cycle assessment to promote sustainable landscapes?
21. How do we effectively link mechanistic and agent-based models in simulating CNHS?
22. what are the right policies for achieving optimal scale of economy relative to the natural systems?
23. How do individual values and governance Systems interact to produce outcomes?
24. How can climate change adaptation and mitigation be integrated?
25. What is the plasticity (ease of change) and elasticity of major human drivers of environmental change?

26. What kinds of policies or strategies improve the environmental and/or socioeconomic outcomes?
27. How do we break through and begin discussing the role of hard/uncomfortable issues in coupled processes (e.g., privilege, racism, etc.)?
28. How can we systematically consider the tradeoffs between decisions across coupled and human and natural systems?
29. How do natural resource institutions influence the adaptive capacity of coupled systems?
30. How can we learn about ecological boundaries before we cross them, and adjust our human systems to avoid irreparable damage?
31. What types of outreach measures are needed to draw the link between humans and natural systems for non science demographics?
32. How do we create a translational research framework for managing human ecosystems?
33. Can CHANS that are "islands of sustainability" seed up their successes?
34. Which type of studies will be the most efficient, focused, and productive?
35. To what extent should research design and management be different to best address CNH issues?
36. What are the linkages between ecosystem services and human well-being?
37. What characterizes tipping points in human/social behaviour?
38. What are the best ways to study these dynamic couplings?
39. What effects of changing agricultural trends will have on modern human diet and/or nutrition?
40. How do we truly incorporate iterative process into our decision making process?
41. How can we better use existing data sets to describe human-natural system interactions?
42. What are the interrelated and interacting human institutions that must be created/altered to identify and cope with different coupled-system changes?
43. What level of communication across disciplines is necessary to successfully achieve interdisciplinarity? (i.e., how do we avoid just adding an economist to a project and calling that "human dimensions")
44. How can we develop management tools with incentives to best manage shared goods?
45. How can the proliferation of data access and computational power improve our understanding of CNHs?
46. What areas of human systems have the greatest potential for mitigation of human impacts on natural systems?
47. What essential 'rules' are most important to understand in various complex adaptive systems being managed?
48. Under what conditions do social and ecological disturbances create positive/negative feedback and positive/negative social and ecological consequences?
49. How does scientific information--e.g., predictions, risk assessments, response plans, or scientific study in general--influence people, organizations, and societies in their approach to coupled or potentially coupled systems?
50. What role should citizen stakeholders play in CNH research?

51. What are the human consequences of anthropogenic climate change, and how will those human consequences further shape coupled human natural systems?
52. How do humans perceive their place in natural systems? Particularly people who live in developed/industrialized cultures.
53. How is the global economy affecting land-use change at regional and finer scales, and how does this land change impact natural systems?
54. what can we know about the behaviour of systems to new human and physical perturbations?
55. Are people willing to change their behaviors to protect natural systems from degradation?
56. How do economic and institutional factors interact at multiple scales to influence local conditions?
57. How can human incentives be better aligned with their spatially and temporally removed impacts?
58. how does human perception drive system dynamics?
59. How do we measuring resilience in CHANS, and the how then do we develop predictive models of resilience?
60. How do we draw system boundaries in our research for effective input to management?
61. Are members of human systems aware of their systems impacts over natural and climate systems?
62. How can we deal with externalities of human activities?
63. What is the range of "coupling" between humans and nature--e.g., are there any places where there is minimal coupling; what are the places of maximum coupling and how does the closeness of ties impact capacity for management?
64. How can you quantify phase shifts, resilience and thresholds in social-ecological systems?
65. What are the social drivers at multiple scales of coupled complex systems?
66. How can humans best mitigate anthropogenic climate change?
67. Whose interests should take precedence in development particularly in developing countries which still require a lot of natural resources, people or the environment or both?
68. how do we rebuild the connection between humanity and the natural environment in order to foster a protective attitude to sustainability?
69. how can connections to nature of a global urbanizing population be strengthened
70. how do changes in the environment feedback on individuals, groups and institutions?
71. How do different socio-cultural contexts affect CNH research itself (applying CNH in other countries etc.).
72. which modeling tools and at what scales are suitable for understanding and forecasting land use change in developing regions?
73. How do we find more resources for research and management?
74. How do short term actions affect the long term behavior of the CHNS?
75. How can we globally find new pathways of development that maintain current quality of life in developed countries and raise quality of life in developing countries without compromising Earth's life supporting capacity?

76. Under what conditions are changes in natural system conditions most likely to affect human awareness of and response to environmental change?
77. How can we measure and account for ecosystem services in decisions and connect this to policy-making agendas?
78. How do knowledge tools work that support collaboration between those who need to work together to manage coupled human and natural systems?
79. What non-linear feedbacks exist between human civilization and components of the Earth-system?
80. what factors enable motivated people to govern SES effectively?
81. What determines how people in the role of decision-makers value the environment?
82. Are there systematic patterns in coupled interactions that can support the development of a unifying theory of coupled systems?
83. What is the nature of the dynamic couplings in CHANS?
84. How can we more realistically model complex, multi-scale, multi-actor coupled human-natural systems?
85. How do values influence human behavior in regards to natural systems?
86. How are feedbacks manifested between human and natural systems?
87. How can we work better with the media to educate the public about these systems?
88. How do people collaborate to understand the environmental systems they need to engage?
89. How do we co-produce knowledge between scientists, managers and society
90. How can political constraints to sustainable management be overcome?
91. How do people in the system perceive and respond to land use change (either their own action or that imposed upon them from externalities)
92. human consumption has likely already outstripped sustainability. how do we promote the concept of REDUCING global population?
93. What are the points at which ceding decision making about highly technical matters to a professional elite break down?
94. What factors of the human system affect the environmental system?
95. Time lag effects: Why do time lags apply to some aspects of coupled human and natural system dynamics? How so?
96. How does climate variability and water resource accessibility effect population growth and distribution?
97. How can we integrate more realistic human decision making into CHANS models while at the same time controlling for the inevitable increase in complexity that this entails?
98. How do we transfer findings from CHANS studies into recommendations for policy managers?
99. How do we recognize teleconnections and represent them in CHANS models?
100. s there a single, overarching explanation for the biophysical/sociocultural process interactions in CNH's?
101. How to plan for ever increasing human populations around natural areas?
102. How do land use and land cover change influence household and/or community vulnerability and vice versa, especially in marginal environments?
103. How do we evaluate models of environmental change in a no-analogue earth system state?

104. What kinds of governance systems contribute to improved social and ecological outcomes?
105. How can we better couple / communicate / regulate across disparate and widely spaced geographic regions? e.g., water use within watersheds needs to couple municipalities, industries, resource managers everywhere in the basin, including the coastal zone, but getting farmers to talk to fishermen working 100's of miles away is next to impossible
106. How rapidly can humans adapt to changing ecological circumstances in the current context, and how does that compare to past adaptive behavior?
107. What alternative pathways of development are available that have a lesser impact on ecosystems and the biosphere?
108. What are the feedback structures that inter-relate the coupled human and natural systems?
109. how to better link ecosystem services research to human well-being
110. How much mechanistic knowledge is needed of coupled systems dynamics in order to predict likely responses?
111. Epistemological and philosophical - how much of human action, and the ways that humans couple with natural systems, stems from intrinsic vs extrinsic factors? Social sciences are way too 'intrinsic' focused. We need more on the big picture and more awareness for how some processes seem to affect very different value systems in similar ways. Preferences and values aren't everything. This is the elephant in the room.
112. Where do individuals obtain information about the natural environment and their impact on it, and how do they evaluate the reliability of that information?
113. How to optimize ecological quality and how this affects human well-being
114. How does human learning at the individual and group level affect the interaction of coupled systems?
115. How do humans perceive and react to changes in climate and the natural environment over short- and long-terms?
116. How to define and stay within planetary boundaries?
117. How can we best translate coupled systems knowledge to inform policy and practice?
118. How can we design natural resource management approaches that reflect and work with biophysical variability (in time & space)?
119. What pathways of governance can work with complexity, feedbacks, and adaptive management?
120. How do these systems respond to sudden/dramatic external impacts (like rapid climate change)?
121. How do telecouplings (i.e., socioeconomic and environmental interactions among CHANS over distances) evolve?
122. What characterizes sustainable land use systems and how can we transition to such systems?
123. how can we use our knowledge of cities - the ultimate CHANS - to understand and manage other coupled systems?
124. How do systems interact across scales?
125. What are ecological and socio-political consequences of land cover change?

126. What can be/has been gained from knowledge of coupled natural and human systems?
127. How do you quantify the values humans place on natural resources?
128. How can we best manage and protect fisheries and wildlife in human altered landscapes?
129. How can we utilize our new-found abilities to acquire, store, and process information to manage ecosystems?
130. how & why & where are people responding to climate change, including changing their land cover and GHG emissions?
131. What are the environmental and social impacts and underpinnings of a sustainable and just food system?
132. How can we address applications of CHNS theory in policy and practice?
133. How can we effectively treat technological-infrastructural systems within a CHANS framework?
134. What are the main principles governing the interactions between human and natural systems?
135. What factors predispose CHANS to be more or less sustainable, both in absolute and in relative terms?
136. How do we reform global governance (UN work) so that scientists and research carries the day?
137. slow variables vs. fast variables: Which system elements function as underlying, persisting, slow variables vs. fast variables?
138. What are the largest impediments to mitigating climate change?
139. would the mushrooming of sustainability programs at the graduate level produce the critical mass of people who appreciate coupled human and natural systems?
140. What types of science has a real influence on management?
141. How are the forces of globalization and climate change interacting?
142. What urbanization strategies best promote sustainable urban landscapes?
143. On what time scales do coupled human and natural systems operate? Or, more importantly, on what time scales are we able to study coupled human and natural systems?
144. How do we best bring together empirical content from vastly different empirical traditions to parameterize coupled systems models?
145. how and when do humans begin to feel connected to their natural surroundings?
146. How do we better understand linkages between systems?
147. Under what conditions do people exhibit limited or strong ability to respond to the (anticipated or observed) effects of climate change?
148. are existing governance structure, policies and service delivering mechanism effective in addressing marginal places and persons in urban areas especially in the third world economies?
149. How can we best use the reciprocal nature of CNH systems to support resilience?
150. how can governance systems become resilient in the face of rapidly changing ecological-social systems?
151. How can we transform the human dimension to be more aware of its integration and dependence on natural systems?
152. How do resource users respond to declining resource availability?

153. How is ecosystem resilience changing with the advent of climate change and changing land use/cover?
154. How is the matrix of land uses related to patterns of biodiversity?
155. Are human adaptation processes similar for a variety of global change drivers (e.g. climate change, globalization) despite local context? Search for general CHANS principles
156. How to co-produce knowledge of CHNS among various stakeholders for learning and action?
157. How do people in the system perceive and respond to climate change (either their own action or that imposed upon them from externalities)
158. How can we manage complex ecological systems?
159. How do we convince society of the value of data? We cannot manage if we have no information.
160. How do we measure externalities and interactions in coupled human-nature systems?
161. How can we identify thresholds and warnings of transitions that lead to degraded benefits to people or difficulties in restoring those benefits?
162. How vulnerable population are adapting to climate change in different parts of the world?
163. What mechanisms facilitate social learning for sustainability
164. The meaning of Good life. Is good life predicated on one negative environmental foot prints?
165. how will climate & other global env changes (e.g., water availability) affect agricultural systems in different areas of the world?
166. How do the characteristics of coupled human and natural systems shape the tradeoffs between ecosystem sustainability and resilience?
167. Data compatibility: how to reconcile data for different CHANS components when these data are collected at different spatial and temporal scales?
168. how management planners can use basic science most effectively
169. How can we incorporate multiplicity of scales in our models, research design, etc.?
170. How do we radically reduce GHG emissions while at the same time creating just development?
171. How will spatially differential climate change impacts affect local, national and international policy responses?
172. Are tipping points a useful concept? How can we help to monitor and identify them?
173. How are the clear facts of coupled human and natural systems obscured in policy, in management, and in Western cultural orientations?
174. What constitutes evidence of tight coupling in human-natural systems?
175. How to transform cultures to live into being more sustainable social systems.
176. Understanding the impact of extreme events on coupled human and natural systems
177. What is the most successful blend industry and capitalism with protection of natural environments?
178. How can we build science/arts conjoined programs in the public school system with limited budgets?

179. How to assess trade-offs among ecosystem services quantitatively to optimize ecosystem functioning and human livelihoods
180. What sorts of drivers further mitigation and adaptation to climate change?
181. How do we identify critical linkages btw human and natural systems and how generalizable are these linkages across systems and regions?
182. What is the role of bottom up versus top down policy in the management of these systems?
183. Development of CHANS theory - do we really have guiding theory
184. What is the role of spatial scale in understanding the coupling between natural and human systems?
185. Scale - what aspects of H-E interactions are cross scalar?
186. what drives variability in social and natural processes, and how are they interlinked?
187. How do feedbacks control coupled human and natural systems?
188. Can there be a meeting point between economic development and the environmental protection?
189. What are the feedbacks among sending, receiving, and spillover systems in the telecoupled world?
190. How can we effectively leverage rich place-based studies and "big data" to create a more comprehensive knowledge?
191. How do telecouplings shape socioeconomic and environmental sustainability across local to global levels?
192. Can can we better understand and manage the environmental impacts of the resource and waste streams through which people's needs and wants are met? meeting people's
193. How can we assess social and natural systems in common units?
194. How to foster green growth in a manner that is both sustainable and builds resilience/adaptive capacity?
195. How does measurable and deep uncertainty related to coupled human and natural systems influence human decision making?
196. How to use scientific results in climate to address CHANS research?
197. What types of education and skills are needed by CHANS scientists?
198. How do human responses to change alter the environment?
199. Do network-based hydrologic CNH's behave in fundamentally different ways from patchwork-based terrestrial CNH's?
200. How can coupled-system complexity be reconciled with societal need for a degree of clarity and predictability, and how does this need vary at different social/ecological scales?
201. How do we communicate the complexity of coupled systems to managers and policy makers?
202. What are appropriate and effective methods to bring stakeholders together to address environmental issues.
203. how rapidly are human societies able to adapt to and cope with environmental change and disruption
204. What are the mechanisms and circumstances that create the conditions appropriate for successful collective action?

205. How to stop forest disappearance due to the expansion of industrial agriculture and urbanization?
206. How do we move beyond ecosystem services to re-conceptualize CNH linkages?
207. How can we best describe and convince politicians to make decisions with a coupled human/natural systems framework?
208. how can we use our knowledge of 'natural' systems to understand cities?
209. How to show that complexities, incentives and uncertainty matters in the coupled human and natural systems?
210. How might we use non-traditional ontologies in interpreting, understanding and managing CHANS?
211. How can we deal with issues of discounting?
212. What are the most appropriate ways of understanding the relationship(s) between humans, other species and the environments we share?
213. How can we accurately measure human response to a CHANS project?
214. How are the human and natural systems coupled?
215. Can the public trust doctrine offer a framework for delivering better social and ecological outcomes?
216. Can regime shifts (i.e. shifts from one basin of attraction to another) be predicted based on system "flickering" (based on recent ecological, economic research) for different domains (i.e. ecological, economic, political, social)? Search for general CHANS principles.
217. What are the effects of exponential economic growth on individual ecosystems and the biosphere as a whole?
218. How do global environmental changes affect the dynamics of regional and local coupled systems, and how to these feed back to higher level processes??
219. what is the most effective way of communicating current scientific knowledge to broader part of society with a particular focus on decision-makers, and resource users?
220. How can people adapt to changing system behavior while still getting what they need from the system?
221. Development of CHANS methods - is there more than just integrative modeling?
222. To what extent is our understanding of hierarchies in CHANS an accurate reflection of what is occurring? Are there other explanations?
223. How to link income streams to various ecosystem services so that better environmental outcomes can be realized?
224. How to build (or manage) sustainable ecosystems that are resilient to change and provide ecosystem services for humans?
225. What are some economical and social factors that prevent sustainable agriculture and permaculture to succeed?
226. What products/outcomes are most useful and relevant in this 'era' of 'wicked problems' and 'post-normal science?'
227. How can we effectively identify both the relevant human and nonhuman actors within systems?
228. What are the perceived and real tradeoffs in valuing specific ecosystem services (for society, environment,...)?

229. How might we apply non-traditional epistemologies (ways of knowing/methods) to understand CHANS?
230. How can an environmentally sustainable energy system be constructed within existing institutional frameworks?
231. How can resource management practices better integrate ecological resiliency and anticipate disturbance
232. What set of conditions induces an individual human response to environmental change?
233. How to transform the monetary system and the economy so that they don't require growth to avoid collapse and so that they don't continually concentrate wealth and power in few hands?
234. Feedback loops: how do human and natural systems interact?
235. How can science (ecology) embrace novel ecosystems?
236. How sustainable are our current industrial food systems?
237. how can we simulate coupled natural human systems to understand the complex behaviors of these systems?
238. How can we incorporate feedbacks that emerge at multiple temporal and spatial scales into scientific studies?
239. What's the economic trade-offs in multiple-use management of nature resource issue?
240. How can uncertainty be more effectively employed in understanding and managing coupled systems?
241. Why and how do social inequalities emerge, grow, persist, and diminish, and with what consequences?
242. How do coupled systems co-evolve or co-adapt?
243. How can the interaction of social systems and natural life sciences better interact to stop species loss?
244. What factors determine the degree or strength of local coupling or decoupling between the social and ecological portions of CHANS?
245. How to best achieve balance among multiple resources, multiple uses and multiple sectors?
246. How does the spatial configuration of land uses contribute to ecosystem services and sustainability?
247. What is the degree of the success of urban biodiversity conservation in major cities of the world?
248. Do people have an appreciation for their impacts on natural systems?
249. How to best manage CNHS feedbacks for both human needs and the environment's good.
250. How can our improved understanding of neuro-functions of the human brain influence decision sciences in general and our appreciation of cooperative behavior in particular?
251. How can we "unresilience" the bad system dynamics while enhancing the "good" dynamics?
252. What are the appropriate time frames for understanding CHANS and how to determine the necessary time scale?

253. How is human decision-making likely to change in response to future landscape, environmental and socio-political change?
254. Why do we need interdisciplinarity?
255. What is the extent of the existence of resource curse in areas with abundant natural resources but high rate of poverty?
256. How do different types of ownership of resources (public, private, commons, nullius) affect the viability of CHANS?
257. How does social organization mediate human interaction with the environment, i.e., amplify or attenuate perceptions of risk associated with environmental change
258. What issues need to be investigated from prism of CHANS
259. How do people perceive risk and make decisions around environmental issues with risk and uncertainty?
260. Under what sorts of circumstances does land sharing as opposed to land sparing occur?
261. What other global environmental change besides climate change pose threats to sustainability
262. how do human social networks affect the way humans interact with ecological systems?
263. What leads people to respect natural systems?
264. How can research inform the urban sustainability community to foster creation of resilient cities?
265. What are the key sets of internal system feedback connections, that are most likely to trigger system change, or be affected by external changes?
266. how to improve management in different fields finding nexus between categories now divided
267. how can we reintegrate humans into our conceptualization and management of 'natural' systems?
268. What are the perceptions of landholders/land managers of environmental issues and how do those compare to public perceptions and scientific knowledge?
269. What is the role of variability in system behavior?
270. How can we protect the glaciers, highlands and the local population from opencast mining?
271. How can we apply new information technologies to understand transformations of complex coupled systems and anticipate their consequences?
272. What is the proper scale at which coupled human and natural systems ought to be studied?
273. How do we ensure regulations are flexible and practical but ensure environmental safety?
274. How do ecosystems services/ natural capital and other forms of capital produce human well-being?
275. how can we quantify/incorporate culturally valued resources in SESs?
276. what motivates people to care about the environment?
277. What are the relationships between cultural values, management and natural systems?
278. How can we explore the question of networks between and within CHNS?

279. How can we formalize and quantify the human behavior at multiple spatial and organizational scales?
280. How best can we represent human built elements of natural systems and human decisions/behavior in coupled process models?
281. How can we provide 9-10 billion people with a decent quality of life and still maintain the ecosystems on which global society depends?
282. How do human-induced changes in global climate affect ecosystem biodiversity and services at finer spatial scales?
283. How can natural processes (i.e. ecosystem services) be integrated into human-dominated landscapes?
284. How can we improve knowledge creation with diverse disciplinary scales of importance? -- methodological and epistemological challenges
285. What are appropriate levels (of both human and natural systems) to investigate linkages. I.e. at what level do interaction matter most?
286. What conceptual frameworks provide mechanistic and predictive power without becoming reductionist and exclusionary for other disciplines
287. How far has economic valuation of natural resources helped in protecting natural systems from destruction and over-exploitation?
288. What are the costs and benefits of channeling human and fiscal resources to coupled systems research vs fundamental disciplinary research?
289. How can we design socio-ecological research that is relevant to the social communities affected by ecosystem processes?
290. What new data sets should we be building to improve our modeling of human-natural system dynamics?
291. how to educate public on link of extreme events to long term changes in human natural system
292. How do dynamics at higher or lower scales affect the sustainability/resilience of a given CHANS?
293. what factors do positively contribute to reducing impact of global market system that erodes resilience of social-ecological systems?
294. How does the CHANS community responsibly create and implement a set of coherent, assiduous, transparent, and repeatable research designs and accepted practices to test hypotheses about coupled human natural systems?
295. How can we change the stovepipe attitudes of academia and its stovepipe training of students?
296. How can we rescue natural systems in socially depressed areas of big cities in Latin America as a tool for human development?
297. How can issues of accelerating uncertainty for future projections from coupled human-natural systems be modelled?
298. How do we communicate these issues to the general public?
299. What are the underlying processes or mechanisms for the complexities of coupled human and natural systems?
300. What other factors are most important in changing human behavior?
301. How can conservation of natural systems provide resilience of human systems to impacts of climate change, such as extreme weather and rising sea levels?
302. What are the motivating factors for humans to protect natural systems?

303. To what extent are CNH processes culturally, geographically, or subject specific, and to what extent can we find transcendent properties of the ways in which coupled systems evolve?
304. How will the benefits provided by nature and the persistence and distribution of species change in the future?
305. What attitudes, dispositions, and knowledge are needed to further the transition to a just sustainability?
306. What makes a social ecological system resilient?
307. What are the constants in socio-ecological perception and values across race, culture, and economic status?
308. What does "couple" mean?
309. How do interactions among human and natural systems vary across spatial and temporal scales?
310. Are there common patterns of change across CHANs?
311. What are the social and economic challenges to moving forward to a low impact path of development?
312. How can we understand causation in complex coupled systems?
313. How can society better control the spread of invasive species that endanger agricultural and native ecosystems?
314. How do policies influence human-nature interactions?
315. Behavioral - why do people use resources one way in this place but a different way in another place.
316. how can scientists (both natural and social) be better integrated into policy-making, resource management, and decision-making of elected officials and those running governments?
317. How do we account for legacy effects?
318. Can we develop lab- and field-based models that help better understand as well as predict how human decisions influence physical systems and vice-versa?
319. Can we identify patterns of behavior that cut across multiple types of CHANS and at multiple levels of analysis? (I mean whole system behavior, rather than human behavior here.)
320. What are common key indicators of system change (social and ecological) and how can these be better predicted?
321. To what extent might we develop a "global culture" of understanding and managing CHANS?
322. Under what scenarios will drivers of urbanization and land use change promote sustainable city development?
323. What institutional frameworks best facilitate adaptation to environmental change and resources scarcity?
324. What do we address the complex interlinkages between rural livelihoods and natural resource use in the face of climate variability?
325. when and how might environmental (climate), ecosystem, or human population thresholds (catastrophic crashes) occur and how do we forestall them?
326. How to best link small scale (e.g., agent or household based) decisions within larger system wide processes?

327. How can we design protected areas that are both biologically effective and socially just?
328. How can analysis of currently employed measures of H-E interactions be maximized / improved upon in order to improve observations or change?
329. how to weight the importance of long term consequences into decisions on human impacts on ecosystems?
330. how do human interactions with an ecosystem circulate through ecological networks?
331. How to employ an ecosystem services approach to management from the local to global scale?
332. What are the impacts of globalization on human-nature interactions?
333. What is the role of CHANS researchers in the policy debates that are generated as a function of the community's research?
334. Do people respond to predictive indicators of environmental stress
335. How can we ensure that inter-disciplinary projects that include non-academic stakeholders become the norm rather than the exception (especially in sustainability science)?
336. What learning tools will provide people with the greatest capacity to successfully adapt to global environmental change?
337. How do human activities alter ecological landscape processes?
338. How ongoing and future climate change will be affecting agriculture sector?
339. What theoretical frameworks can be applied to the explanation of coupled system dynamics that scale from micro to macro and span human and biophysical systems
340. How can we design decision-making structures to bring together groups with disparate objectives?
341. To what extent do natural system process affect human decision-making and behavior?
342. How do scientists, managers, and the vast majority of others interact to share knowledge and power over decision making?
343. How persistent is youth education (into adulthood) and how effective is 'spillover' to parents?
344. what is the impact of human-induced land cover change on climate? (need more site studies, data)
345. What are the relationships among environment, population dynamics, settlement structure, and human mobility?
346. How do we couple environmental sustainability with social and economic sustainability?
347. How is environmental change affecting people's long-term capabilities to thrive as a species?
348. How can human civilization withstand threats to it's longevity or existence?
349. What are feedbacks between human impacts and natural system change?
350. What is the expected future of human civilization and life on Earth?
351. What is interdisciplinarity?
352. How many syllabus or curriculum at the undergraduate level include CHANS?
353. Moving beyond the case study in the governance of CHANS

354. how human per capita population growth rates will change, spatial distribution of change
355. understanding the impact of degradation in upstream parts of river systems on ecosystem services delivery
356. How do these systems grow and change over very long time-spans?
357. If not, can we identify the reasons for difference either across type or across scale?
358. ecology justice and adaptive capacity : how to manage impacts?
359. How local biophysical changes from human interventions influence regional and global biophysical processes - especially with respect to water?
360. How can the existing knowledge of human behavior within multiple social science disciplines serve in answering Q1?
361. Scalar questions - how to link ecological processes, policies, management at multiple scales
362. What can data science increase analysis, (feedback), and response to CHANS processes?
363. How to sample annual systems within long term studies.
364. The scale at which humans are most capable of sustainable interaction with the natural world?
365. how human consumption patterns will change in coming decades
366. How to properly address and study "the interaction term" between human and natural components of CHANS?
367. when communities have never paid for ecosystem services how to get communities to start contributing especially in a context such as India where enforcement is very weak?
368. How to mitigate and adapt to climate change.
369. How to understand context-dependency and place as a driving force
370. How variability in the environment can be understood as an asset in both natural and human systems.
371. Which policy interventions can succeed in altering/maintaining the outcomes noted in previous question?
372. How decision making is coupled across scales
373. Transforming (or retrofitting) existing socio-political systems/institutions that serve as barriers to change (e.g. It seems logical to put a solar panel on every rooftop in the southwestern U.S. and avoid destroying thousands of acres of wildlife habitat yet we haven't seen that happen yet due to political and economic reasons))
374. Is governance up to the task of managing global change
375. Evaluating biodiversity for human needs
376. innovative approaches for promoting adaptation to climate change
377. the interactions among ecosystems and human health, especially in urbanizing areas
378. More equitable distribution of benefits & burdens of Global Change processes
379. generating political ecology/economy methods that incorporate history, asymmetrical power and access
380. Developing tools to measure various ecological services with economic currencies.
381. How about the social culture of community has been applied on managing the natural resources?
382. Feedbacks between system dynamics and human decision making/management

383. Natural resource management policies that equally weight social and ecological priorities and outcomes.
384. Social inequality, including between countries, and its role in human-natural system dysfunction
385. Addressing the issues of poverty and sustainable livelihoods on environmental degradation
386. The ability of humans to adapt to a more ecocentric behavior and lifestyle?
387. Political and social development decisions and their impacts on natural systems
388. Including human health issues that are generated by the intersection of human and natural systems
389. Managing perspective: Empowering community-based decisions that satisfy as many stakeholders as possible
390. The biggest question is likely the interrelationship of food use and production - energy use and production - and climate change
391. The relationships of settlement types to ecosystem types
392. How can these be integrated to better inform each other to make wise use decisions?
393. Effects of telecoupling or teleconnections between global markets and local SES
394. Links between environment and livelihoods to alleviate poverty.
395. how to properly situate chans research in an institutional/political context
396. We need to better understand feedbacks between human decision-making and the natural resources/environmental factors that these societies depend on.
397. Global market impacts on ecosystems and their management
398. Better understanding the multi-scalar nature of CHANS, particularly the affect of mismatch between social (i.e. governance) and the ecological, as well as the signals that are affecting larger and smaller scales
399. Integrating technological advances to manage and mitigate environmental change.
400. Anticipating and adapting to new and novel conditions in response to climate change and demographic pressures
401. How to integrate across spatial and temporal scales
402. Understanding coupling at the micro social scale and the relationship, if there is one at the macro-scale
403. Peaceful means of sharing declining resources
404. social and cultural impacts - and changes in them - on system interaction
405. understanding the relationship between ecological change and behavioral change
406. use of past systems behavior as a predictor for future systems behaviors
407. Modeling human behavior & decision-making
408. The 'big equation' is that relating the size and growth of human populations (demography) to resources (ecology and economics) to conservation of species (many fields) - we need more questions focus on this big relationship
409. Population dynamics in ecosystems with heavy human usages
410. Improved (primary) education on CHANS complexity and ways to live with it
411. decision making under uncertainty
412. socio-ecological resilience and its implications for environmental, economic, social trade-offs
413. Moving from individual change to collective action

414. Human influence on the biogeochemical cycling of toxic trace elements within Earth's System
415. Quantifying the spatio-temporal interactions among human and natural systems
416. Change in human-natural systems relationships across scales.
417. better foundation of decision making linking neurological-behavioral-sociological perspectives
418. Multi-scalar dynamics of resilience and tipping points of SES
419. Arriving at a steady-state economy
420. Best impact: cost ratio uses for government incentive programs to foster improved management
421. GMO safety, confinement, and ecological impact
422. Water. All aspects of security, scarcity, vulnerability and management.
423. Relationships between ecosystem services and function in human dominated systems.
424. Understanding of uncertainty in climate systems and the ways that it translates to decision making on risk for human and natural systems
425. role of ideology in understanding system change
426. Perception of Environmental Change and Response to it
427. Redefining and/or re-understanding "economic growth", green accounting is a start towards this but not enough
428. Changing human behavior to promote ecosystem health
429. How to better represent social systems and processes in CHANS models
430. Anticipatory reflection about systems change across diverse time scales with management in a shockingly narrow timescale
431. incorporating behavior, anticipating tipping points, emergent properties and regime shifts especially for ecosystem function, and social organizations
432. how human population patterns with ongoing changes in water availability
433. Shale gas energy development in interior natural areas and effects on local communities (socioeconomic)
434. Data integration across natural and social science remains a fundamental challenge
435. Moving from proxy variables and simple models of human behavior toward direct measurement
436. Changing natural/urban communities in the face of climate change and how to better prepare for expected changes.
437. Path to a post-capitalist or at least capitalism 2.0 society
438. integrating social science to understand individual and group behaviors and values and how they scale up in coupled human-natural systems
439. feedbacks between variables across systems
440. Maximize prosperity and ecosystem function
441. We need to do more experimental work where we run randomized control trials to examine how different policies can lead to better management of CHANS.
442. Human Perception Towards Natural System
443. generalization of findings from case studies
444. Understanding the vulnerability of coupled human and natural systems to climate change

445. On the human side, in my opinion there is opportunity for further investigation of how human relationships with the natural world have changed over time and could change in the future. Culture supports the idea that technologically advanced humans like to think that we are able to use technology to control the natural world enough to ensure human survival. However, climate change may show us that we are still or may again become more vulnerable to variability in nature when we have difficulty attaining targets for agricultural crop yields due to erratic climatic variation. Although it hasn't happened yet, I see this likely little injection of humility into public discourse as a potential opportunity to exploit for other benefits for ecosystem management in the future. I am currently working on a philosophical project that includes this issue.
446. how to integrate social and biophysical data (methodological)
447. The factors resulting in robustness vs. evolvability of human systems in the face of climate change
448. Impacts of climate change on major ecosystems and human interactions with them
449. Effective integration of efficient high population density communities within an urban sprawl framework (e.g. Houston)
450. Long and short term socio-economic impacts of contaminated ecosystem mitigation due to Hydraulic fracturing processes
451. defining the linkages between human and natural systems
452. how to value effectively the natural capital facing uncertainty of environmental changes.
453. reciprocal feedback effects between human and natural systems
454. defining the data needed to conduct a CHANS approach
455. Enhancing ecosystem services while reducing negative anthropogenic effects
456. Integrating models for a Global System Science that serves to both Design and technology of biological and socio-technical systems
457. role of technological change and human adaptations in managing CHN systems
458. Prediction of human responses to natural events
459. Scaling up smaller-scale analyses of managed processes in the environment to reflect policy and governance
460. We need to better identify the drivers of human decision-making regarding land use/land cover change and natural resources - only by doing that can we identify better policies for sustainable development/conservation of the environment
461. tradeoff between resolution, model fidelity, scale, and tightness of coupling
462. integrating social and ecological/biophysical data across local to global scales
463. feedbacks between evolving concepts of nature and the rapidly changing earthscape
464. We need a metalogic that allow more effective integration of aspects of the CHANS systems
465. Understanding dynamics and feedbacks between social and ecological sub-systems
466. Improved capacity for adaptation & transformation (re-organization) in a time of accelerated change
467. What self-organizing and managing parts are necessary
468. improved assessment strategies at appropriate time and space scales
469. Transferable operationalized metrics showing connections between social and ecological systems.

470. Interplay of local-global governance of SES
471. the similarities, differences and relationships between physical, biological and sociocultural evolution
472. Connectivity of wildlife habitat across the landscape
473. cumulative impacts and their cumulative effects
474. Improved medium & long term co-viability of ecological and social processes in CHANS
475. tipping points in systems
476. emergent properties in CHANS
477. If both, how can we strike the balance?
478. What is the perceived value of the cost or benefit of management of the major drivers in 1 and 2?
479. Cooperation in the Commons
480. Integrate humans in a natural world rather than treated them as 'coupled'
481. defining human well being operationally
482. low level of public concern over the environment
483. lead and lag times in system change
484. unified framework to approach the study of chans
485. How do they recognize each other at all?
486. How do they recognize each other's responses?
487. Are CHANS dynamics lawful?
488. Above questions at LOCAL/REGIONAL scales.
489. Developing a road map to accomplish the first two
490. Adaptations to a changing climate
491. Human valuation of nature
492. What is the most effective way to study them?
493. globalized transformation of ecological risk
494. above question focusing on evolving concepts of human connections to nature
495. all further questions derive from #1 above.
496. The super-complex interaction between human and nature
497. The human position and responsibility within the Ecosphere?
498. changing lifestyles
499. Analyses that cross boundaries of rural/urban domains
500. And general questions looking across scales and boundaries/edges
501. economic, ecological and social sustainability of systems providing food and water
502. economic development and climate change mitigation
503. thresholds
504. How do we find more resources so that that people are not overwhelmed?
505. It is the reason I did not proceed with the survey after clicking once before.
506. get rid of "coupled" and deal with humans as ecosystem engineers -- there is only one system.
507. complex system interactions
508. Traditional ecological knowledge
509. Adaptation to Environmental Change
510. Human Health
511. management

512. Community based ecosystem management
513. Wildlife Diseases, zoonotic and not.
514. How about the technology has been applied on managing the natural resources?
515. resilience
516. Local Biggest Never-ending Environmental Issue
517. modeling complex system dynamics
518. Scaling
519. It should have been in the end.
520. Resource Use
521. This will take me a lot more than 10 minutes to complete.
522. evaluation of quality
523. human motivations and behaviors- including human well-being
524. Urban interface with wildlife
525. profit-oriented capitalism production system
526. what are the coupled human-environmental systems? Any specific example?
527. The quantization of human activities
528. Tradeoffs
529. Climate change
530. Growth and shrinking of human population
531. Feedback from one subsystem to another
532. Approaches to sustainability
533. Careful measurements of agricultural systems
534. reducing poverty
535. Scale
536. carrying capacity of the earth
537. feedbacks
538. post-normal science
539. evaluation on impact
540. Discounting