

In Chapter Four of *Panarchy*, Westley, Carpenter, et al. discuss the relationship between social and ecological systems, and proclaim that people and nature cannot be simplified to these systems without further investigation. They define a social system as "...any group of people who interact long enough to create a shared set of understandings, norms, or routines to integrate action and established patterns of dominance and resource allocation." Other defining features of social systems include forward-looking behavior – the ability to foresee the future and react in anticipation of it. This is uniquely human, and is related to other unique characteristics of consciousness, communication, reflexivity, and making meaning. In contrast, *Panarchy* defines ecosystems as "...places on earth that consist of biotic components and abiotic of physical components," to result in set of structures that is dynamic and self-organizing. This chapter seeks to explore the extent to which these systems can be treated as separate, and the similarities/relationships between them. After completing the reading, interacting with others in class, and playing the games, I have come to believe that the largest differentiator between these systems is language (communication), and the ability to conceptualize abstract concepts. This results in complex interactions between the two, and overlap as well as inherent difference.

Why is it commonly believed that we as humans are superior to nature? I think that because we have the ability to communicate and include democracy in our day-to-day lives, we often treat ecological systems as though they are at our disposal. Nature does not have the ability to advocate for itself, which results in humans using them however they like to benefit our social systems. The ability to manipulate nature feeds into our idea that we are superior to it. When we were playing the fishing game, we had a lot of conversations about considering the tragedy of the commons, and the relationships between us and other fishers. As systems thinkers (a very small percentage of the total population), we also considered trying to leave more fish in the pond in order to benefit the ecosystem. Even though we were *aware* of the fish and this ecosystem, they still do not have a voice of their own to advocate for themselves. We can guess what they might want based on science or intuition, but ultimately we are never hearing directly from the source. Consider when people speak for you in an effort to communicate your feelings – even if the communicator has the best of intentions to accurately portray your perspective, it can differ from how you truly feel. Imagine if you were never able to express your ideas or feelings on the topic (similar to the way that nature cannot), they would most likely be misrepresented in some way. Does this mean that we are never able to equally represent nature and what will truly be best for them? I think that this results in an innately unbalanced relationship between social and ecological systems because they lack the ability to communicate or even conceptualize these thoughts. It is important to recognize this discrepancy and do the best we can to try and figure out what the nature would want from a systems perspective, as this is far better than the alternative.

Is there a way to simply coexist with ecosystems if they cannot communicate to negotiate a fair deal? I had never thought about this before, but now I find myself questioning if leaving an ecosystem alone is equivalent with coexisting and equally weighing our systems in terms of what gets priority. I think that it depends on the

situation, as sometimes humans have already intervened and action on our part is required to return the system to the original state. On the other hand, it is sometimes best to let nature react and adapt by itself, and demonstrate its' reactive and flexible characteristics.

Do we actually have more absolute power than the ecosystems themselves (without humans)? Both social and ecological systems have the ability to change on a dime, and dictate the other's reaction. For social systems, it could be the result of a terrorist attack – something that dramatically shifts ideologies and subsequent action. After 9/11, there was a sharp increase in airport security. This demonstrates the clear shift in social systems, but also resulted in ecological ones. There was a need for more materials from nature, and an increase or decrease in the amount of people flying in planes inherently affects the environment. Similarly, natural disasters affect both ecological and social systems – both independently and in reaction to each other. Hurricane Katrina disproportionately flooded underprivileged neighborhoods and resulted in broad distress across social systems. This also clearly affected nature and ecosystems themselves (because of the actual storm). After the fact, people needed resources and made lifestyle adjustments that required certain elements from nature, resulting in further impact on ecological systems. These systems drive and reinforce each other, and have the ability to develop both independently and in tandem. I was intrigued by Paul Robbins' discussion of the man-made condition that produces wildlife in Banglor, India. This was a unique situation in which business and nature intersect, and demonstrates the every-changing dynamic nature of the relationship between these systems

I am coming to realize that the initial prompt asked about the *relationship* of these two systems, and as a human, I immediately began to question which system is superior. Maybe this is the problem in itself – we place these systems in comparison to each other instead of just coexisting with alternatives. What are the long-term consequences of this way of thinking?