NACTA
north american colleges and teachers of agriculture
connect | develop | achieve

Designing Quality Student Reports in an Agroecosystems Analysis Course

Introduction

One integrative requirement of a week-long summer Agroecosystems Analysis course hosted by four universities from three states is a final student team document (Wiedenhoeft et al., 2003). After visiting farms and interviewing farmers in the Upper Midwest, teams of three to four students prepare an initial oral presentation for instructors and peers in the learning community, followed by a final written analysis addressing the sustainability of each farm. After extensive group interaction to plan their written reports, the teams return home and communicate electronically for the next month to craft a final written team document. In their written reports the groups explain their methods of evaluation, discuss their results, and present their conclusions about the sustainability of each farm. Although they are free to choose their own parameters, the groups often assess sustainability in terms of productivity, economics, environmental impacts and social viability for farms, families and communities (Rickerl and Francis, 2004).

Methods

For each of the last 16 years, approximately 28 students and four instructors have stayed for a week at Dordt College in Sioux Center, Iowa and traveled out each day to visit eight or nine farms and one or two prairies. Pre-course readings describing alternative models of analysis are used to provide students with some background knowledge (Bland, 2007; Hamiti and Wydler, 2014; Conway, 1990; Olson, 1998). After arriving on campus students are assigned to teams based on gender, university, major of study, and life experiences. During the first class session students are encouraged to discuss the merits of each of the models. After the discussion each team determines the model or combination of models they will use to analyze the sustainability of a farm system. They often struggle initially with the “open-ended” method of analysis, i.e. no one universal model and how to include multiple components of the model are recommended by instructors. Additionally, some students struggle with the responsibility of deciding what is important and how to collect information and analyze results in the absence of a clear road map to explain exactly how they are to accomplish the task (Francis et al., 2009). This type of case study has no pre-determined “right” answer. Working in teams students utilize information from the farmers and observations made during the visits to identify the key issues of sustainability for each farm. Final project reports are evaluated by the four instructors in order to achieve consensus on grades and generate comments that are sent to each of the teams to enhance their learning experience.

Over the years we have noticed some patterns in the reports. We have summarized these by identifying 1) favorable sections, types of analysis, and supporting information, and 2) common shortcomings in the reports. This compilation could be of value to future teams in the summer Agroecosystems Analysis course or other student team activities where time is limited and teams need to reach consensus on what is most important to include in a report. The observations of teachers in this set of reports were reinforced by experiences reading reports over the past 16 years from the teams of students.

Favorable Components

Agroecosystems analysis reports generally are well organized, often linear in pattern with a description of the models employed and definitions of key terms. They cover all the farms

visited, as per instructions, and seek to cover the four dimensions listed above: production, economics, environment, and social. Some of the common observations of the positive qualities of reports include:

Some reports demonstrate excellent writing and editing, use of spellcheck, and articulate descriptions of farms and the students' observations; often the observations are quite complete, even when analyses and evaluation are deficient.

Reports sometimes include a brief history of the region, types of farms, crops and systems, and an overall context that sets the stage for the team's interviews, data collection and analysis, and evaluation within the context of the watershed and region.

Several reports demonstrate creative modifications and combinations of parts of previously-used models from the literature, as presented in the pre-course readings and introduced with examples on the first day of class. Often the combined models are robust and appropriate, although their implementation is highly variable.

Teams often describe the successes and weaknesses of using their particular model, a higher order idea that helps them as well as readers put the results and conclusions into context; this step suggests to teachers additional areas to emphasize in the future.

Some reports include creative and illustrative models and diagrams that visually support the text and provide a quick guide to understanding an overview of the analysis; tables are also useful to provide a quick overview of results and add to a report's value and clarity.

Conclusions to reports generally are useful as an overview of the analyses and comparisons, although student teams at times do not take full advantage of this section to pull together all of the valuable information that has been assembled and processed. Probably this is the weakest section.

Some reports incorporate additional ideas from the learning community that were gleaned from exercises during the oral presentations; this is seen as a way of validating or extending the work of the team to capture more ideas and observations from their classmates.

Sections and Components that Need Improvement

All of us who write reports or manuscripts can improve what we do. It is especially evident that students preparing team documents for the agroecosystems analysis course could improve their final reports and thus their grades by looking carefully at the following observations:

Some of the reports did not include a title and/or a list of authors, thus introducing confusion at the outset.

A number of reports suffered from poor use of English, lack of careful editing, or other lack of attention to organization and detail; tables of contents and clearly labeled sections of the reports make them more accessible and understandable to readers.

Many reports used terms such as "efficiency" or "sustainability" without providing a clear definition of what was meant in their specific reports. Because these words often have multiple meanings depending on context and the system components used and how they are measured, precise definitions are essential.

At times a model is defined and used to evaluate the farms, however, in some cases the utilization is inconsistent causing confusion for the reader; this internal inconsistency may have been the result of multiple authors and a lack of careful editing after assembling the pieces.

Reports often state a number of conclusions without supporting evidence from observations on the farm, information from a farmer interview, or literature citation; this makes for weak statements that could be much improved with some documentation.

Lack of diagrams or figures in a report often leads to a lengthy, repetitive, and boring presentation that is not compelling to the reader; figures can be used to illustrate key components and/or interactions on a farm in the analysis.

Lack of tables often leads to repetitive written summaries of data, e.g. ratings of several indicators, farm by farm, becomes tedious and difficult to grasp, when a simple summary table of the same indicators across farms could be quickly viewed and understood.

Since this is an Agroecosystems Analysis course that is based to great extent on biological and ecological dimensions of the farms, precise mechanistic and engineering-type diagrams showing simple cause and effect relationships may be less appropriate than those that illustrate interactions, complexity, and multiple factors that impact the sustainable workings of a farm.

Ignoring references to the literature suggests that this dimension was not useful to the team in conducting their analysis and evaluation, and including these adds to credibility and completeness.

Using General Observations to Improve Reports

Reviewing the above observations of positive and negative aspects of the reports would be useful for future teams in agroecosystems analysis or in classes where teams are required to develop a written presentation after agreeing on the method of analysis of information and a format for reporting. These observations by instructors represent a careful reading and evaluation of multiple reports, as well as accumulated experience from many years teaching the same course. Teams could first decide on methods and then quickly decide on appropriate sections for a report. The most efficient teams often divide the tasks among members so that it is clear who will do what and when. Once there is agreement and the data and observations are organized and presented in writing or in figures and tables, the entire team can do editing and critique of the document using the above observations as a checklist to emphasize what is positive and fill in the 'potholes' that almost invariably appear in an initial draft of a team document. We hope this reflection on class documents from a summer travel class will be useful to future students and to instructors who provide guidance for such class exercises.

References

Bland, W. and M. Bell. 2007. A Holon approach to agroecology. International Journal of Agricultural Sustainability 5:280-294.

Conway, G. 1990. Concepts. Ch 2. In agroecosystem analysis for research and concepts. Winrock International Institution for Agriculture. Morrilton, AK.

Francis, C., J. King, G. Lieblein, T.A. Breland,L., Salomonsson, N. Sriskandarajah, P. Porter, and M. Wiedenhoeft. 2009. Open-ended cases in agroecology: Farming and food systems in the Nordic Region and the US Midwest'. Journal of Agricultural Education and Extension 15:(4)385— 400.

Hamiti, S.W. and H. Wydler. 2014. Supporting the integration of sustainability into higher education curricula—A case study from Switzerland. Sustainability 4(6):3291-3300; DOI:10.3390/su6063291

Olson, R.K. 1998. Procedures for evaluating alternative farming systems: A case study for eastern Nebraska. Extension and Education Materials for Sustainable Agriculture, Vol. 8, Center for Sustainable Agricultural Systems, Univ. Nebraska – Lincoln, NE. p. 39-44.

Rickerl, D. and C. Francis, editors. 2004. Agroecosystems analysis. Monograph 43, American Society of Agronomy, Madison, Wisconsin.

Wiedenhoeft, M, S. Simmons, R. Salvador, G. McAndrews, C. Francis, J. King and D. Hole. 2003. Agroecosystems analysis from the grass roots: A multidimensional experiential learning course. Jour. Natural Resources and Life Sciences 32:73-79.

Submitted by:

Robert De Haan, Dordt College, Sioux Center, Iowa
rdehaan@dordt.edu
Paul Porter, University of Minnesota – St. Paul
pporter@umn.edu
Mary Wiedenhoeft, Iowa State University, Ames, Iowa
mwiedenh@isu.edu
Charles Francis, Univ. Nebraska – Lincoln
cfrancis2@unl.edu