

Preparing Communities for Shale Development through Sustainable Planning

Module 1: Introduction to Shale Development and Planning Process – Teaching Outline

Introduction:

This introductory module will address a broad range of topics that Extension Educators will want community leaders and residents to be familiar with in order to fully understand the projected impacts of shale oil and gas development. These topics include:

- What is high volume hydraulic fracturing and how does it differ from traditional drilling technologies?
- Where are the shale plays located in the US? Which regions are the most active in terms of production? What are the growth projections for shale development?
- What are the boom-bust characteristics of natural resource dependent communities?
- What steps does shale development take in communities, from leasing to drilling, production, processing and transportation?
- What are the expected environmental, economic and social impacts, short and long-term on a community and region?
- How can planning based on sustainability cornerstones help a community to address these impacts for long-term community health and vitality?

This curriculum is intended for use by Extension Educators with leaders and residents in shale impacted communities to help them understand and prepare for the environmental, social and economic impacts of shale development. Using a “train-the-trainer” approach, the initial target audience is Extension Educators and the intended external audience is community leaders and residents. This curriculum, resources and instructions are presented in a format that will enable Extension Educators to use this curriculum on their own and modify it to meet the specific needs of their communities and regions. There will be specific circumstances unique to each state and region (regulatory environment, type and location of shale play, for example), so this module is intended to also help Educators identify resources that will help them tailor this program to their own community and region.

Learning Objectives: Community leaders and residents in regions impacted by shale development are seeking to gain understanding and implement planning strategies that will prepare their community for short and long-term benefits and challenges. This introductory module will provide an overview of social, environmental and economic



impacts, setting the stage for the more in-depth educational sessions to follow. It will also introduce participants to the sustainable planning approach, and provide guidance in the establishment of a planning structure, and process expectations. Finally, an interactive exercise, facilitated by Extension Educators, will engage participants in a process designed to gather community input, a crucial factor in the creation of a plan based on sustainability cornerstones.

Workshop Author: Myra Moss, Ohio State University Extension

Process Used: Power Point presentation and group exercise. Power point slides for the overview presentation and written narrations for each slide are provided. Guidelines and suggestions for organizing and facilitating the group exercise are also included.

Length: The module (presentation and exercise) can be accomplished in 90 minutes. However, two hours will allow more time for discussion.

I. Presentation

(45 minutes – Extension Educators)

Use power point slides and written narration. The narration is designed to provide information and a “script” for each individual slide that the instructor can use to prepare and customize their presentation.

Purpose:

Provide an introduction to shale oil and gas development and an overview of the sustainable planning process including the following topics:

- a) Shale resources and projected growth
- b) Description of hydraulic fracturing
- c) Boom-bust characteristics of natural resource based economies
- d) Overview of social, environmental and economic impacts of shale development
- e) Overview of Sustainable Planning process

Outcome:

- a) Participants will have a general knowledge of shale development
- b) Participants will understand boom-bust characteristics of natural resource based economies
- c) Participants will gain an overall understanding of the anticipated social, environmental and economic impacts from shale development
- d) Participants will understand how to implement a Sustainable Planning initiative to address shale development impacts

II. Set up and facilitate an interactive Engagement Exercise

(5 minutes for set up, 40 minutes for exercise)

Following the presentation, the participants will engage in an interactive Exercise, the purpose of which is two-fold:



1. To gather feedback on the community's Assets and perceptions of the short- and long-term Challenges and Benefits from shale oil and gas development, and
2. To help participants begin to adopt a sustainability perspective.

Set up the Exercise by dividing the participants into three self managed groups – those involved in the social sector of the community, those involved in the economic sector, and those involved in the environmental sector (if you know the participants beforehand and which sector they represent, you may be able to divide them at the beginning of the session by placing name tents on the tables. This will save time). Examples of agencies or individuals and who they represent includes:

- *Social Sector:* Housing, social services, education, seniors, health care, religious community, workforce development, others
- *Environmental Sector:* Built environment – historic society, building restoration services, infrastructure (water, sewer, power, roads, broadband, others). Natural environment – parks, nature preserves, farmers (conservation easements), others
- *Economic Sector:* Economic development (Chamber of Commerce, Community Improvement Corporations, Economic Development professionals, others), retail merchants, downtown organizations, entrepreneurs, workforce development, others

Assign an Extension Educator to work with each group. They will provide the questions to be addressed by each group and help to keep the input gathering Exercise on time and on track. If needed, the Educator can help to facilitate the discussion and record the input on a flip chart. Allow each group 2-3 minutes to report out the key results of their discussion. Extension Educators will capture and post these results on flip charts at the front of the room so that all participants can see them.

III. Debrief

(15 minutes: group discussion facilitated by Extension Educators)

- a) Extension Educators review the key themes on the flip charts, and then facilitate participants in identification of common themes shared by social, environmental and economic sectors
- b) Share what participants learned about the impact of shale development

A detailed outline of the interactive Exercise process and agenda is provided under Module 1 Tools.

IV. Materials

The educational materials in this module provided to participants will include:

- a) Copy of PowerPoint presentation



- b) Program evaluation template
- c) Handouts for interactive Exercise

V. Supplies Needed by Instructor

- a) Flip charts and markers for each workgroup to be used to record their input results to share with the rest of the group
- b) Flip charts and markers for the Extension Educator to record key themes from the group presentations
- c) LCD projector and laptop to project power point slides
- d) Copies of materials for each participant

Additional Resources:

OSU Extension Shale Education Program:
<http://serc.osu.edu/extension>

OSU Extension Shale Library:
<http://serc.osu.edu/extension/shale-library>

Natural Gas Drilling : Questions Residents and Local Leaders Should be Asking,
Mike Lloyd, CDFS-1282-12 <http://ohioline.osu.edu/cd-fact/pdf/1282.pdf>

Adapting to Shale Based Development through a Countywide Approach:
Lessons Learned from Jefferson County, Ohio
Joe Campbell and Chris Hogan, CDFS-1283-13
<http://serc.osu.edu/sites/d6-serc.web/files/uploads/Shale%20Campbell%20Hogan%20Fact%20Sheet.pdf>

Summary of Hydraulic Fracturing in Ohio
Eric Romich and Stephen Schumacher, SOGD-DEV1-12
http://ohioline.osu.edu/sh-fact/pdf/Summary_of_Hydraulic_Fracturing_in_Ohio_SOGD-DEV1-12.pdf

U.S. Energy Information Administration: Detailed information on reserves and production of shale oil and gas throughout the US and the world
www.eia.gov

For additional information, please contact the author:

Myra Moss, Extension Educator, Ohio State University Extension
moss.63@osu.edu
740.607.5177



Slide #1:

The recent convergence of two long-practiced drilling techniques, hydraulic fracturing and directional horizontal drilling, has transformed the oil and gas industry. *Hydraulic fracturing is the process of applying high-pressure hydraulic force into an oil and gas wellbore to fracture the underground shale rock formations, creating a pathway for hydrocarbon fluids to flow to the surface (Romich and Schumacher, 2012).* Shale energy development often occurs in communities that are unprepared for the surge of land aggregators, shale workers, increased demand for public and private services, and windfalls for individual landowners. Shale gas development has been variously framed as a major opportunity for economic revitalization at the local and regional levels and energy independence at the national level, but also as a significant environmental risk, with uncertain and uneven economic benefits (Schafft, Borlu, & Glenna, 2013). The oil and gas extraction will have an impact, in some cases positive and in others negative, on the economic, environmental, and social fibers of the community.

Slide #2:

Rural communities that are affected by the expansion of shale energy development are exposed to the long-term economic fluctuations experienced by natural resource dependent economies. In the short term, shale energy development will lead to an increase in economic activity, specifically in the construction phase including the drilling wells, transportation, and the establishment of pipelines and infrastructure. Following the development phase which normally last a few years, producing wells and completed pipelines will require relatively few workers, ultimately ending the boom in economic activity. Like other natural resource-based economies, oil and gas development typically follows a boom-bust cycle, where a contraction will follow an economic expansion based in the natural resource sector (Farren, Weinstein, and Partridge, 2012).

While the short-term economic impacts are significant, it is essential that the environmental and social implications of shale energy development are understood and managed as well. Environmental impacts associated with shale energy development include impacts to air quality, water availability, water quality, seismic activity, and the local community. For example, several state emission inventories have shown that oil and natural gas operations are significant sources of local air pollution and that shale gas operations may lead to increased levels of ozone and hazardous air pollutants near these areas (Clark, Burnham, Harto, and Horner, 2012). Social impacts associated with shale energy development include impacts to community infrastructure, access to housing, cost of living, education, and personal finance.

