VIRGINIA WATER RESOURCES RESEARCH CENTER

Community-Based Sustainable Development Planning

By

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and

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Executive Summary

Defining sustainable development is a difficult task. The definition of the word 'sustainable' and what qualifies something to be sustainable have been debated for years. Only in the past thirty years have the words "sustainable" and "development" been paired together in literature. It was not until the late 1980s that sustainable development began to be a theme in planning and development. Today scientists, politicians, students, developers, architects, engineers, and other stakeholders continue to research, study, and define sustainable development.

The goal of this research is to define community-based sustainable development and to critique the use of third party organizations in sustainable development planning. The study approach consisted of reviewing current literature, conducting critique of a third-party sustainable development planning workshop, and exploring opportunities for sustainable development of a case study site.

The case study site for this research is a seventy-eight acre proposed development in Floyd, Virginia. Land owners and stakeholders of the site have proposed to develop the site as a sustainable community or "Eco-Village" that will incorporate advanced sustainable land use and building practices. The New River Valley Planning District Commission sponsored a sustainable development workshop (May 29 - 30 2008) for the study area. Southface consultants were invited to conduct the workshop as a third party and to apply Earthcraft Sustainable Land Development criteria to study site. The workshop attendees included stakeholders from Floyd and Montgomery counties. The workshop included a technical session (sustainable development charrett design) and a policy forum. A critique of the workshop concluded that sustainable development planning does not necessarily require a third party organization. However, because sustainable development is not currently the norm, many stakeholders and professionals who would like to utilize sustainable development need guidance and assistance in knowing what tools and opportunities are available to them, and where to start. Third party organizations such as Southface, offer that, at a monetary cost. Using a design charette, practiced in the workshop, may not be the most effective way to go about planning when involving all stakeholders, but collaboration in some way is important to the community aspect of sustainable development.

To assess the opportunities for sustainable development on the property, a site visit was completed and geographic information systems (GIS) map data was gathered. This report provides an outline of opportunities for developing the study site in a sustainable manner. The report is concluded with some future research needs for planning community-based sustainable development planning.

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1. Introduction

Urban sprawl and uncontrolled land development is a major environmental and socio-economic concern of the 21st century. There is a need for land development processes that minimizes impact to the natural environment, conserves water, habitat and energy, and encourages developing self-sufficient and healthy communities. Since 1980s, the concept of sustainable development has been promoted to meet the above needs.

The goal of this research is to define community-based sustainable development and to critique the sustainable development process using a third party organization. The study approach consisted of reviewing current literature, conducting a critique of a third-party sustainable development planning workshop, and exploring opportunities for sustainable development on a case study site.

2. Sustainable Development

2.1 What is Sustainable Development?

Defining sustainable development is a difficult task. The definition of the word 'sustainable' and what qualifies something to be sustainable have been debated for years. Only in the past thirty years have the words "sustainable" and "development" been paired together in literature. It was not until the late 1980s that sustainable development began to be a theme in planning and development (Beatley 1997). Today scientists, politicians, students, developers, architects, engineers, and other stakeholders continue to research, study, and define sustainable development.

The idea behind sustainability is that a state or process can maintain itself indefinitely (NFDP 2007). For humans, this means trying to maintain and pass on our quality of life indefinitely. Specifically this means efficient use of resources, using renewable resources, and conserving the natural environment and the ecological services that it provides. This leads us to sustainable development. Based on this definition of sustainability, sustainable development is development that maintains or improves the current quality of life over time by using renewable resources and protecting the natural environment.

The World Commission on Environment and Development provides a simple definition of sustainable development which has been accepted around the world. The definition is as follows: "Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission 1987). Although this definition is simple, it is vague and begs the question of "how?" How can we develop in a way that causes little to no harm on the surrounding environment? How can we develop in a way that preserves important resources and maintains water quality? How can current development be an asset and an instrument of conservation and efficiency to future generations?

At the 1992 Earth Summit in Rio, Mohan Munasinghe an internationally distinguished professor proposed the idea that sustainable development is a balancing act between three key perspectives: economic, social and environmental (Muasinghe 2007). He called this the Sustainable Development Triangle and it has become a widely accepted concept to define sustainable development. According to the triangle, for development to be considered sustainable, each of the three domains must be addressed. He says the economic view is seeking to improve human

welfare through growth in consumption, the environmental view focuses on the protection and conservation of ecological systems, and the social view is geared toward empowering the people and enriching their relationships. Focusing on only one or two of these perspectives could lead to: a shortage of resources because of over-consumption, poor air and water quality due to degraded ecological systems, or isolated, unhappy citizens whose voices were never heard, because of poor community planning (Muasinghe 2007).

Both of the above definitions and discussions provide insight in to the future of true sustainable development, but learning how to develop in a way that provides the current quality of life indefinitely and addresses the social, environmental, and economic domains is a work in progress. Sustainable development is an evolving school of thought. Many new technologies and ideas are already available and in use, and the future should bring many more. However, there are several key elements to sustainable development that have already been realized.

2.2 Key Elements of Sustainable Development

As shown in Figure 1, there are four main components that need to be addressed when planning a sustainable development: water, energy, land use, and policy.

Within the water sector, it is important to plan and develop in a way that conserves the quantity and quality of water on site and within the surrounding watershed. The basic concept is to use more available local water sources, such as rainwater and groundwater, and minimize on site movement of generated wastewater. Also, the process should contribute to enhanced water quality and habitat improvement. There are many ways to do this. Rainwater catchment systems can be built onto the houses and buildings to collect rainwater to be used for landscape irrigation, household uses with proper filtering, livestock watering, and groundwater recharge. Appropriately treated wastewater from a building can be reused for crop and landscape irrigation. The developer can use low impact designs (LIDs) and install best management practices (BMPs) such as vegetative buffers along streams, pervious pavement, and bioretention cells (rain gardens) for stormwater management.

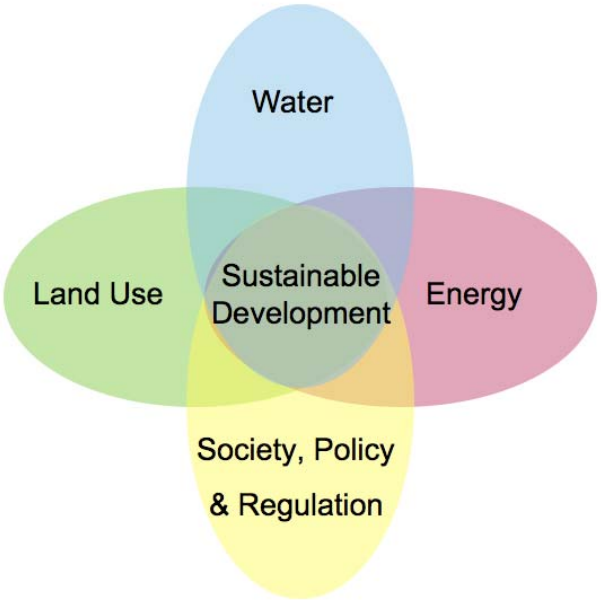

Figure 1. Sustainable Development Venn Diagram

In the energy sector, using local renewable resources, such as solar, geothermal, or wind energy has the lowest impact on the environment. These energy systems more efficient and cost-effective in the long run, and reduce carbon footprint. Using energy efficient appliances and building materials and techniques are important part of green buildings and sustainable development. Many older homes and appliances waste heat and energy because they are inefficient. Recent technologies allow communities to build energy efficient buildings and use energy efficient appliances. Initial costs of implementing new technologies are relatively high but will save money on energy bills in the long run and contribute to environmental sustainability.

The land use sector has many opportunities to encourage sustainability. Preservation of natural habitats and resources such as trees, wetlands, forests, native plants, streams, etc. are keys to sustainable development. These natural features provide important ecological services that will be necessary for many generations to come. One example is natural filtering of pollutants out of air, water, and soil. Preserving natural areas means that new development needs to be dense. This creates less stress on surrounding natural areas, and provides better opportunities for community and social development.

Policy and regulations, specifically the use of incentives, can play a large role in implementing sustainable development. Offering individuals, communities and developers incentives for living and building in a sustainable way, is one way to get people involved and increase sustainable development across all classes. For example, city and county governments could offer faster permitting processes for sustainable developments. Several states including Colorado, Oregon, North Carolina, Texas and Florida are offering tax credits for people that use renewable energy. Local governments can use zoning ordinances that requires dense development and a large percentage of green space as mechanism for sustainable development. Government can also enforce more strict regulations and standards for impacting the environment during development and could protect available natural spaces.

Finally, societal needs and community development is an important aspect of sustainable development in the social perspective. Development should provide opportunities for the community to interact and grow together. For example, building community centers, parks and playgrounds, places where people can gather, adds to natural social growth opportunities. Also, providing paths through communities where people can walk, run, or bike not only offers community interaction, but cuts down on noisy, polluting automotive traffic.

3. Case Study Site: Sustainable Development Project – Floyd, Virginia

The study site is a seventy-eight acre proposed development located at 718 Franklin Pike, about two miles from the quaint downtown of Floyd, Virginia. Floyd is located in the Blue Ridge area of the New River Valley region in southwest Virginia.

3.1 Owners/Stakeholders Land Development Goals

Land owners and stakeholders of the site have proposed to develop the site (Figure 2) as a sustainable community or "Eco-Village" that will incorporate advanced sustainable land use and building practices. They have proposed building five to ten housing units and a community building during the first five years and gradually add more units to reach a maximum of 35 units. They have set the following goals for the project:

- use solar, wind, and/or geothermal energy/ net zero nonrenewable energy use/ zero carbon footprint
- reduce overall water use

- attain at least a 70% reduction in groundwater use
- provide opportunities of organic farming and raising animals
- produce most community food onsite
- design multi-generational housing units to serve a wide range of people
- use the latest green building technologies and with units around fifteen hundred square feet in size.
- recycle as much waste as possible
- design community buildings that provide various community services such as
    - Community kitchen and laundry
    - Community-owned transportation
    - Local farmers market
    - Community Center
    - Health and Exercise facilities (Ozolins 2007)

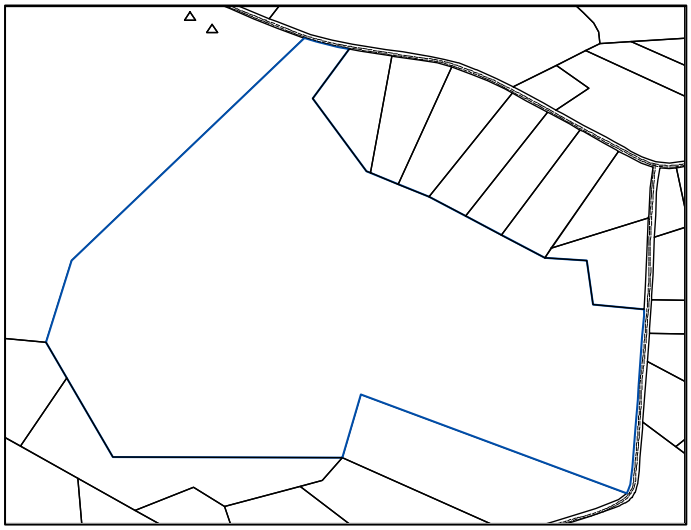

Figure 2. Proposed site (parcel shape) for sustainable development

3.2 Site Characteristics

The property is located on a state sanctioned road, but there are no state sanctioned roads going through the site. However there are several dirt/gravel vehicle paths and trails on the site. The land surrounding the site is predominately agricultural with some residential and forested areas (Figure 3). The property was formerly used for commercial pine tree farming, but there are some significant areas of hardwood trees around the western and southern edges and in the northeastern corner. There are still some young pines left from the previous use.

A permanent stream is flowing from east to west of the somewhat bowl shaped study site. The lowest point on the site is where the stream exits the site on the western boundary at about 2,450 feet above sea level. The highest point of elevation on the property is at the top of the southern slope on the boundary line, at 2,576 feet above sea level (Ozolins, site plan, 2008). Runoff from the entire site enters an unnamed small stream which flows into Pine Creek, a tributary of the Little River, which eventually flows into the New River. Pine Creek, and the Little River have been designated as 'impaired' due to fecal coliform and E. coli contamination and are on 303d list for total maximum daily load (TMDL) report (VA DEQ 2008; Younos 2005). There is also one

intermittent stream flowing from the top of the southern slope and draining into the permanent stream in the middle of the site. The land adjacent to the stream is mildly to steeply sloped with North and South facing slopes. The southern slope rises over one hundred feet from the lowest point on the site, while the northern slope rises about seventy feet. Figures 4 to Figure 7 show the area elevation and streams and various site views.

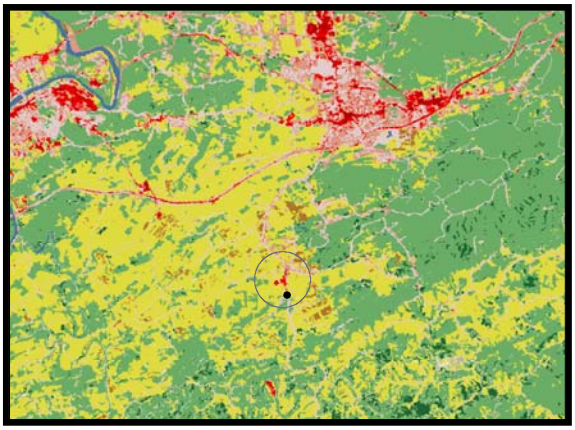

Figure 3. Landuse of study site
Source: USDA NRCS, nlcd-va-utm17.tif

Figure 4. Elevation view of study site
The darker areas represent lower areas: streams.
Source: USGS, EROSDATA Center (gisdata.usgs.net)

Construction of an office building at the northwest entrance of the site is underway (Figure 6). This building is being built with passive and active solar devices, as well as a horizontal geothermal system to provide energy for power and heat to the building. A rainwater catchment system will also be installed on this building. The stakeholders plan for this to be a LEED certified building. The northwest portion of the property (Figure 6) shows this building, the remaining pines from the original tree farm below the building, and an area of natural hardwoods behind the building. Installation of a geothermal power system is being completed on the right side of the building.

Figure 5. View of the southern slope

Figure 6. View of northern slope

Figure 7. View of stream at western end of the property

4. Third-Party Sustainable Development Workshop

The New River Valley Planning District Commission (NRV-PDC) sponsored a sustainable development workshop (May 29 - 30 2008) for the study area. Southface consultants were invited to conduct the workshop as a third party and to apply Earthcraft Sustainable Land Development criteria to study site. The mission of Southface, a nonprofit organization, is "promoting sustainable homes, workplaces and communities through education, research, advocacy and technical assistance" (www.Southface.org). Usually, a community or a group of stakeholders bring the Southface Earthcraft program into a project to assist them in planning their sustainable development. After the development is complete, Southface then awards the community with a certificate designating it as a "Certified Earthcraft Community." The workshop attendees included stakeholders from Floyd and Montgomery counties that included: architects, engineers, planners, policymakers, landowners, future investors, and other interested parties (see Appendix A). The focus of this research report was the Floyd County site and planning process.

4.1 The Workshop Process

The major tenants of an Earthcraft sustainable development workshop include:

- Good walkability/bikability to encourage community interaction and a healthy lifestyle
- Native Landscaping
- Water Conservation and Quality
- Preservation of green spaces and trees
- An integrated planning process where all stakeholders are involved

In general, the Earthcraft sustainable development workshop also addresses issues such as site selection, energy, stormwater management, transportation, and land disturbance. Earthcraft communities require at least thirty-five building units of mixed uses, including retail, and mixed-use residential (www.earthcrafthouse.com/about/communities). Usually a facilitator conducts the workshop.

This specific workshop was consisted of two main parts: a sustainable development design charrette for one site in each county (Floyd and Montgomery) and a regional policy forum. A design charrette is an intense design session that is accomplished within a very short time (a few hours). The goal was for the site stakeholders to collaborate, discuss, and agree on the major objectives of their sites, then design their sustainable developments plan. The Floyd workshop began with an introduction to the site followed by a design charrette. The facilitator used an original master plan (Figure 8) that was developed by the project architect as a starting point for working with the stakeholders. The architect had developed the master plan with considerations on goals and values described in Section 3.1 above.

The facilitator led the attendees through the Earthcraft Communities worksheet (see Appendix B). This worksheet lists the following seven areas in which a total of 100 points must be gathered:

- Site Selection
- Water Management
- Planning and Design
- Preservation Landscape
- Community Engagement
- Green Building
- Innovation

Figure 8. Original Master Plan for Study Site

Community certification requires a total of 100 points; 35 of which are automatically awarded for completion of threshold items, leaving 65 points that must be gathered within those areas at the discretion of the sustainable development team. There are many options within each area for the team to choose from.

Workshop participants first discussed the existing site features and then outlined goals and problems. After this, the facilitator walked through the goals, problems, and opportunities and attempted to draw out a revised plan that meet Earthcraft goals. Stakeholders named at least twenty goals but did not prioritize them. When they attempted to talk about how to meet each goal based on the features of the site, they had trouble staying focused on an issue long enough to make a resolved decision. However, they did decide on some major changes.

The stakeholders decided to move all of the housing units to the north-slope in a more dense development, to preserve the natural hardwoods and open space, as well as provide more room for gardening and agriculture. The houses will be green buildings run on solar and geothermal power, with rainwater catchment systems on all roofs. These were the only major decisions that were made by the end of the charrette. However, stakeholders did come close to some final decisions on other issues. They will probably keep all agricultural activities to the east side of the property, place an orchard on the southern slope, and locate the community building near the residential development for convenience. The stakeholders are also leaning towards piping the rainwater downhill to a laundry facility. There was long debate over how to deal with wastewater but the issue was left unresolved. The state of Virginia does not distinguish between black and grey water, so it would be difficult to recycle water on this site, because special permitting would be difficult to acquire. However, this is a goal of the stakeholders.

Following the design charette, a Regional Policy Forum was held. During this time, all stakeholders in the region broke out into groups to discuss policy issues that were raised during the design charettes. These groups discussed policy related to following issues: water sources/conservation; geology/karst; limited sources of potable water; parking and transportation; affordable housing; density; development options; connectivity; green space. Each group discussed policy options for the region with specific emphasis on incentives for each policy issue. The groups presented the results of their discussion to the entire workshop for comments. The workshop was then concluded.

4.2. Critique: Earthcraft Workshop Planning Process

4.2.1 Technical Session: Design Charette

Four critical issues were identified in conducting the workshop: 1) lack of advance preparation and workshop material; 2) participants' lack of relevant background knowledge related to sustainable development issues; 3) lack of good facilitation; and 4) appropriateness of Earthcraft standards to study site. These issues are discussed below.

The workshop could have been more productive and efficient if there was some advance preparation. First of all, the workshop facilitator did not provide required data to the workshop participants for informed decision making. For example, the Floyd group did not have available soil surveys, hydrology or groundwater information, knowledge of existing infrastructure and important wildlife on or near the site, or a site model. Second, most stakeholders were not educated on the actual possibilities for sustainable development in relevant areas: wastewater, water, energy, etc. Better understanding of background information related to these areas would have made the process more efficient and valuable, because less time would have been lost explaining these issues. This leads to the question of whether the charette should be for professionals only who may already have an understanding of the issues. However, one major tenant of the Earthcraft program is integrated planning which is planning that involves all levels of stakeholders.

A third problem with the Floyd group was too many voices and lack of good facilitation. The large group had too many goals: both large and small. There was not enough time to cover all stated goals in one charrette. It would have been better if the group had chosen top three to five goals and focused on solving them. They could work on meeting smaller goals later in the planning and development process, instead of jumping from topic to topic without fully resolving one. For example, when the group was discussing how to reach the goal of reducing groundwater use by 70%, it led to what rainwater catchment should be used for, which led to wastewater. Before a decision was made stakeholders began debating how to deal with wastewater, instead of making a decision about rainwater use. When displaying ideas put forth by the group, the Floyd stakeholders had to draw everything on the paper. The Montgomery County group took a more efficient approach. They used a model (wood blocks) with removable pieces to test different designs. The model and pieces were much easier and more efficient to work with, than redrawing parts of the site with every new idea. Charettes are meant to be fast-paced and short, drawing can take time. Plus models can give a more real and accurate depiction of a site.

Finally, some of the Earthcraft standards presented problems for the site. The biggest issue was in the area of wastewater. Earthcraft does not allow septic systems to be used for wastewater disposal, but the state of Virginia allows septic systems. There are some exceptions to septic systems that Virginia will allow such as experimental wetlands, which the group discussed, but because the site's runoff enters an impaired stream, it is highly unlikely that an exception would be permitted here. This issue was left unresolved, but it begs the question, does the Earthcraft program have standards that are applicable everywhere? Not every site is the same. Can sustainable development be standardized? Southface has never conducted a sustainable development workshop in a mountainous region before, nor had they worked in a karst (limestone bedrock) region before. This presented problems in the Montgomery County Charrette, because Earthcraft has no standard or experience for building on karst. Cost issue was never discussed. Sustainable development can be expensive, especially some of the measures the Floyd

stakeholders are planning to implement. Will the stakeholders be able to acquire the financial support that this development would demand? That should be discussed as plans are made.

4.2.2 Policy Forum

It is necessary to have the policy forum after the charrette because that is when policy issues arise and discussed. The policy forum was not as productive as expected for the following reasons: 1) lack of participants' basic policy knowledge of relevant issues; 2) absence of appropriate facilitator; and 3) lack of time for full debate and discussion. These issues are discussed below.

Many participants did not understand relevant policy issues well or how to form policy options and incentives. The group kept discussing and explaining the many issues within the topic and were unable to talk about policy. For example in the water resources group, many people did not understand basic concepts, like the difference between black and grey water, or the definition of an incentive. More time and a preparatory session are necessary to fully understand and discuss the relevant policy topics. The absence of an appropriate facilitator to keep the group on track was another critical issue. The groups were easily sidetracked and had difficulty getting specific with broader topics. Reporting to the entire workshop was rushed, so there was not enough time for comments or ideas from the rest of the participants. It should noted that the policy forum took place toward end of the day so workshop participants had trouble focusing and seemed anxious to leave.

4.3 Summary of Workshop Evaluation

Overall, the use of a design charrette for sustainable planning is a good idea. It puts people under pressure to get a lot done in a small amount of time, and it allows different stakeholders to have input and learn from each other. From this experience though, this type of planning would be most effective if it remained in the professional realm. Architects, engineers, policy makers, and others already have basic understanding and background information in dealing with issues of development. The dialogue would have been more effective, the process more efficient, and the result would more satisfying, if this were the case. Then, a presentation or meeting with all stakeholders could be held to include the additional levels of input. Furthermore, the organization of the charrette needs to be carefully planned ahead of time. Part of this organization should include goal-setting and prioritization of goals based on values, assessment of site features and sustainable opportunities and constraints, followed by working through the goals to lay out the site plan. Finances should be a part of the dialogue through the entire process.

The policy forum at this workshop was not very effective. This type of exercise would be best left to those with a good understanding of policy, government and the issues. The organization and timing of this would need to evaluated and updated if used again.

Using a third party organization to facilitate the process can be helpful, especially if there is a lack of understanding of sustainable development, and underlying politics in bringing diverse groups together. Plus, receiving certification can bring prestige to the development site. Using a third party is recommended in that situation, especially if the finances are available. However, this automatically requires participant stakeholders to meet the third party's specific standards. This may not be possible on every site, as was observed with the wastewater issue in this case, and can be very expensive. It is possible to develop in a sustainable manner without bringing in a third party, but because sustainable development is such a new and evolving endeavor, it is not done often. It requires much background research and work by the investor, to find out what is available and appropriate for a particular site.

5. Opportunities for Sustainable Development at Study Site

To assess the opportunities for sustainable development on the property, a site visit was completed and a geographic information system (GIS) map was created. There are definitely opportunities for developing this site in a sustainable manner. The sketch shown in Figure 9 identifies some major opportunities for sustainable development noted from the site visit:

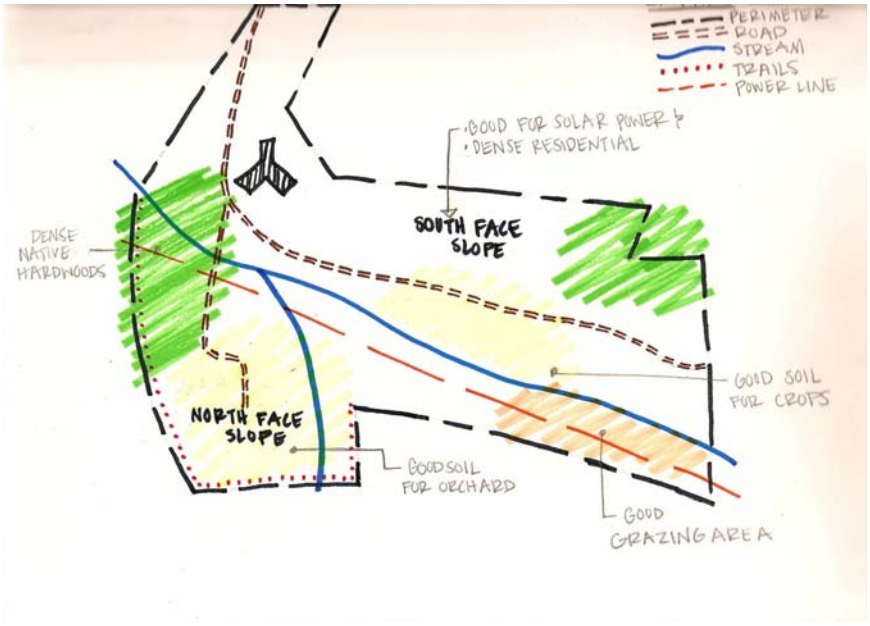

Figure 9. Sustainable Development Opportunities for Study Site

The north, south-facing slope would be an excellent location to place photovoltaic rays to make solar energy, either in a solar farm or on buildings. That slope would be an ideal location to build the dense set of housing units that the community would require, so they could carry the photovoltaic rays on the roofs. South-facing slopes are ideal for solar energy because they typically receive the more sunlight than a north-facing slope. This would leave some area on the north side and the entire south side of the property for green agriculture, organic gardening, and a possible orchard. There are some areas on the lower areas of the north slope, closer to the stream, where the soils are good for gardening. The site has spots that are suitable for installing geothermal power systems.

Floyd receives an average of 42.8 inches of rain per year (NRVEDA 2008). This rainfall amount will yield sufficient water by installing rooftop rainwater harvesting system on the buildings. With the number of proposed buildings, between five and thirty five, there would most likely be enough rainwater to provide for a laundry facility, irrigation of small garden plots, and indoor household uses, such as toilet flushing. If the housing units are located on the top part of the north slope, the collected rainwater can be piped by gravity down that slope to the laundry facility or gardens. A filtering system will be required for indoor uses of water (LaBranche et al. 2007). The housing units and buildings could also be built as efficient green buildings using passive and active solar power, rainwater harvesting, proper insulation, water conservation devices, newer efficient technologies and appliances, and low impact design (LID) for stormwater management.

The site has several substantial native deciduous wooded areas. Preservation and maintenance of these for their ecological services and recreational use would be an opportunity for sustaining the site's current resources. Using best management practices (BMPS) for stormwater and runoff from development, agricultural, and gardening practices would also be an opportunity for sustaining the good quality of the streams on site.

6. Conclusion

This research leads to the conclusion that sustainable development planning does not necessarily require a third party organization. However, because sustainable development is not currently the norm and is still very new, many stakeholders and professionals who would like to utilize sustainable development need guidance and assistance in knowing what tools and opportunities are available to them, and where to start. Third party organizations such as Southface, offer that, at a monetary cost. Using a charette may not be the most effective way to go about planning when involving all stakeholders, but collaboration in some way is important to the community aspect of sustainable development. Future research should be done to investigate other avenues for planning for community-based sustainable development and educating the world on the importance of it.

7. Recommendation for Future Research

Some issues that should be researched in the future include:

a. Can sustainable development be standardized?
If sustainable development can be standardized, could a transferable site assessment manual be developed, that allows a person to look at their property and assess its opportunities and constraints for sustainable development? The stakeholder would no longer need a third party organization, and all of the resources they would need to understand their opportunities and constraints for sustainable development are provided in one simple manual.

b. Is their a way to evaluate sustainable development under a community values system rather than a point system, and would this be as effective? Different communities and regions have different environmental values and issues associated with their geography and culture. How could those be incorporated into their sustainable developments?

c. Could the design charette be used as a tool for the educating professionals on sustainable development opportunities in their communities?

d. Could there be regional or local charette workshop for professionals to learn how to design sustainable developments? This question is currently being investigated by a group of stakeholders in Blacksburg, Virginia, led by Abigail Convery.

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Appendix A: Sustainable Development Workshop Attendees

Abi Convery YMCA
Adele Schirmer Town of Blacksburg, Engineering
Amy Adams Architect- Wall Residences
Anne Guppie Wall Residences
Anne McClung Town of Blacksburg, Head of Planning
Becky Coleman Congressman Bouchers Office
Bill Gardner Floyd Board Supervisors
Bo Abernathy Floyd County Industrial Development Authority
Bob Strenze Developer
Charlie Wade Town of Pulaski, Current Mayor
Chris Burkett Department of Game and Inland Fisheries
Clay Hodges Altizer, Hodges, & Varney, Inc
Colin Arnold Community Housing Partners
Courtney Kimmell Virginia Tech, Landcare Institute
Dave Rundgren New River Valley Planning District Commission, Executive Director
David Wall Wall Construction
David Zachow Direct Connect Solar
Deborah J Cheslow Regional Technical Manager-EarthCraft Virginia
Derrick Meyers Town of Blacksburg, council member
Don Langrehr Town of Blacksburg, council member
Ed Cohn
Elizabeth Vogel Town of Blacksburg, Community Housing
Eric Sallee Developer
Erica Adams Virginia Tech Water Resources Center
Brad Wright Virginia Department of Forestry
Gary Coggins Virginia Department of Health
Holly Lesko Town of Blacksburg, Planning Commission Member
Jack Wall Wall Residences, Owner
James Ruhland Community Design Studio/Community Housing Partners
Janaka Casper Community Housing Partners
Jeff Worrell Town of Pulaski, Newly Elected Mayor/Current Town Council
Jennifer Wilsie New River Valley Planning District Commission, Regional Planner
Jessamyn Losse Community Housing Partners
John Henry VP of Development CHP
John Neel Gay and Neel, Vice-President
John Eustis New River Land Trust
Josh Galloway Better Housing Coalition
Josh Hollway Community Housing Partners
Kamala Bowers Wall Residences, Owner
Kamilia Lawson Community Housing Partners
Karen Drake Town of Blacksburg, Comprehensive Planner
Karl Bren Earthcraft Virginia
Kelley Day Community Design Studio/Community Housing Partners
Kevin Byrd New River Valley Planning District Commission, Regional Planner
Kevin Conner Gay and Neel – Landscape Architect
Lou Murray Virginia Department of Forestry
Mark Schonbeck
Matt Hanratty Town of Blacksburg, Community Housing
Michael Maslaney Town of Floyd, Town Manager

Meredith Jones Tom's Creek Investors L.C. Project Manager/Engineer
Melissa Skelton City of Radford, Grant Writer
Nell Boyle US Green Building Council Roanoke Chapter
Patrick Bixlar Sustainable Blacksburg
Patrick Hughes Hill Studio, Planner
Peter Ozolins Architect
Reginea Elsner New River Valley Planning District Commission, Regional Planner
Richard Caywood Virginia Department of Transportation
Ron Rordam Mayor of Blacksburg
Skip Slocum Real Estate- Floyd Ecobroker
Steve Sandy Montgomery County Planning Director
Susan Anderson Town of Blacksburg, council member
Susan Garrison Town of Blacksburg Public Works Environmental Program Manager
Tamim Younos Virginia Tech Water Resources
Than Hitt Virginia Tech
Todd Peacock Community Housing Partners
Maggie Dorsey US Green Building Council Roanoke Chapter

Appendix B: Earthcraft Communities Worksheet

Sensibly Built for the Environment

CERTIFICATION WORKSHEET

A worksheet must be submitted to EarthCraft Communities for each community to be certified. An EarthCraft House Community certification requires a total 100 points; 35 of which are automatically awarded for completion of threshold items, leaving 65 to be selected by the development team.

Documentation may be submitted via mail, fax, email, or presented on-site to the inspector.

Mail:	**EarthCraft Communities**
	241 Pine Street N.E.
	Atlanta, GA 30308
Fax:	**404-872-5009**
Email:	
Development Group:	
Community Name:	
Contact Person:	
Phone:	
Fax:	
Email:	

Date:

	Points	Score	Initial Narrative Notes
SITE SELECTION			
Threshold: Regional Plans	x	2	
Brownfield Redevelopment	5		
Greyfield Redevelopment	3		
Infill Development -- 25%	2		
Infill Development -- 90%	3		
Activity Center Location	2		
Transit Orientation – Existing Local Bus	3		

Transit Orientation – Planned/Funded Local Bus	2		
Transit Orientation- Existing Rail/Rapid Transit	4		
Transit Orientation-Planned Rail/Rapid Transit	3		
Proximity to Regional Bike Path -- Existing	3		
Proximity to Regional Bike Path -- Planned/Funded	2		
Jobs/Housing Balance	4		
SITE SELECTION TOTAL	36	2	
WATER MANAGEMENT			
Threshold: Construction BMPs	x	1	
Threshold: On-call Personnel	x	1	
Threshold: Post-Construction BMPs	x	1	
Threshold: Turbidity Testing	x	1	
Threshold: No Septic Systems	x	2	
Minimize Mass Grading	4		
Materials Reuse- Erosion Control	2		
Vehicle Wash Station	1		
Runoff Volume Reduction	4		
Water Conservation -Common- Reduce	2		
Water Conservation -Common- Eliminate	4		
Water Conservation - Private	5		
WATER MANAGEMENT TOTAL	***22***	6	
PLANNING AND DESIGN			
Threshold: Site Analysis and Planning	x	2	
Site Plan			
Topography and Aspect			
Soil Series			
Historic, Cultural & Archeological Resources			
Tree Survey			
Hydrological Study			
Aerial Photo of Property			
Viewshed Analysis			
Solar and Wind Access Analysis			
Threshold: Integrated Design	x	1	
Threshold: Bicycle Accommodations	x	1	
Threshold: Pedestrian Accommodations	x	1	
Threshold: Connectivity	x	1	
Internal Connectivity	3		
Ped/Bike Paths- create	1		
Ped/Bike Paths- connect to existing off-site	1		
Hearing and Sight Impaired Accommodations	1		
Bike Lanes	2		
Traffic Calming Design	3		
Street Width – Reduced below local	2		
Street Width – 75% designed to EC specs	3		

Street Trees	3		
Public Parking -Reduce below local	2		
Public Parking -Preferred space	1		
Private Parking	3		
Density	3		
Mixed Use - Development for two distinct uses	2		
Mixed Use - Development for three distinct uses	1		
Mixed Use- Development for four distince uses	1		
Mixed Use- Development for five distince uses	1		
Mixed Use- Development for six distince uses	1		
Civic Use	2		
Housing Diversity -- under 60% AMI	3		
Housing Diversity -- 61-80% AMI	2		
Housing Diversity -- 81-100% AMI	2		
Housing Diversity -- 101-120% AMI	1		
Housing Diversity - Rental	2		
Housing Diversity - Section 8	1		
Community Center - Common facility	3		
Community Center - Intranet	1		
Adaptive Reuse	2		
Adaptive Reuse -- Historic Preservation	1		
PLANNING AND DESIGN TOTAL	***54***	6	
PRESERVATION LANDSCAPE			
Threshold- Greenspace	x	3	
Threshold- Landscape Installation- Mimic and Restore	x	1	
Construction Phasing	1		
Minimize Clear Cutting- 25%	2		
Minimize Clear Cutting- 50%	3		
Minimize Clear Cutting- Replant 25%	1		
Utilities Installation- Reduce Disturbance	2		
Utilities Installation- Install prior	1		
Landscape Installation- Restore	1		
Landscape Installation- Grind Stumps	1		
Landscape Installation- Organic Fertilizers	1		
Onsite Greenspace Preservation -- Tier 1	2		
Onsite Greenspace Preservation -- Tier 2	3		
Onsite Greenspace Preservation -- Tier 3	4		
Offsite Greenspace Preservation	3		
Greenspace Restoration	3		
Habitat Protection Plan	3		
Tree Preservation - Building With Trees	1		
Tree Preservation - Design Adjustments	2		
Tree Preservation - Specimen Trees	1		
Tree Preservation - Culturally-Signficant Trees	1		
Tree Preservation- Association Controls	1		

Tree Transplanting	2		
Materials Reuse- Construction and Energy	2		
Water Quality Buffers -- Streams	3		
Water Quality Buffers -- Wetlands	2		
Stream Crossings	2		
Community Gardens -- Preserve	1		
Community Gardens -- Construct	2		
PRESERVATION LANDSCAPE TOTAL	***51***	4	
COMMUNITY ENGAGEMENT			
Threshold: Community Participation	x	2	
Threshold: Neighborhood Association	x	2	
Threshold: Covenants, Codes, and Restrictions	x	1	
Threshold: Environmental Education Coordinator	x	1	
Threshold: Environmental Education - Public	x	1	
Community Stakeholder Participation -Ongoing	1		
Environmental Education – Resident, Move-in review	2		
Environmental Education – Resident, Signage	2		
Environmental Education – Government, Attempt	2		
Environmental Education – Government, Success	3		
Community-Based Recycling – Facility	3		
Community-Based Recycling - Composting	2		
P2AD Partnership	1		
COMMUNITY ENGAGEMENT TOTAL	***16***	7	
GREEN BUILDING			
Threshold: EarthCraft House	x	5	
Threshold: EarthCraft Multifamily -- Low-Rise	x	5	
EarthCraft Renovation	3		
EarthCraft for Light Commercial	4		
Green Building Certification Program	4		
District Heating/Cooling	6		
Distributed Renewable Energy	7		
Clean Emissions Protocol for Heavy Equiptment	2		
Reuse of Existing Structures	2		
GREEN BUILDING TOTAL	***28***	10	
INNOVATION			
Innovation points	5		
INNOVATION POINTS TOTAL	***5***	0	
EARTHCRAFT COMMUNITIES TOTALS			
SITE SELECTION	36	2	
WATER MANAGEMENT	22	6	
PLANNING AND DESIGN	54	6	
PRESERVATION LANDSCAPE	51	4	
COMMUNITY ENGAGEMENT	16	7	

GREEN BUILDING	28	10	
INNOVATION	5	0	
GRAND TOTAL NEEDED	**100**	**35**	***GRAND TOTAL COLLECTED***