To: The UVM Faculty Senate
From: Curricular Affairs Committee of the Faculty Senate, Laura Almstead, Chair
Date: May 1, 2020
Re: Approval of a proposal for a new PhD in Sustainable Policy Development, Economics and Governance submitted by the College of Agriculture and Life Sciences in conjunction with the Graduate College

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At its meeting on April 30, 2020, the Curricular Affairs Committee approved the actions recommended in the following memo.

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The Curricular Affairs Committee approved a proposal for a new PhD in Sustainable Policy Development, Economics and Governance (SDPEG) from the College of Agriculture and Life Sciences (CALS), Department of Community Development and Applied Economics in conjunction with the Graduate College. The proposed program also includes faculty from the Political Science, Geography, and Economics Departments in the College of Arts and Sciences and utilizes existing Certificates of Graduate Study that involve faculty from CALS, the Larner College of Medicine, the Rubenstein School of Environment and Natural Resources, Grossman School of Business, and the College of Engineering and Mathematical Sciences. If approved by the Faculty Senate and Board of Trustees, the program will be offered beginning fall 2020.

Program Description and Rationale
Challenges to the long-term health and well-being of social-ecological systems are increasing across the globe. Climate change, globalization, economic instabilities, the planet's finite resources, disruptive technologies, and political polarization have elevated the need to focus on sustainable development goals. The proposed SDPEG PhD seeks to develop leaders and applied researchers that will help our state, the nation, and the international community address critical public policy challenges. The core curriculum is built on four pillars common to high-quality programs of this nature (see below). Depth in a specific field will be achieved through completion of one of UVM's existing Certificates of Graduate study in either Ecological Economics, Community Resiliency and Planning, Agroecology, Public Health, Sustainable Enterprise, or Complex Systems and Data Science.
- Theory and conceptualization of the political economy of sustainable development policy, economic and governance systems
- A deep understanding of the threats to sustainability and the local to global scale responses being advanced
- Mastery of advanced applied policy and economic analytics
- Professional development opportunities that include policy internship, communicating science, partnership and collaboration skills, and grant writing experiences

The inclusion of the terms "policy," "economics," and "governance" in the title distinguish the proposed program from sustainable development PhD programs at other institutions that place a heavy emphasis on the

environmental science dimensions of sustainability. The proposed SDPEG PhD is anchored by a strong concentration in research methodology, governance and process design, advanced applied economic analysis, a comprehensive overview of policy processes, systems and networks, and a solid grounding in theories and practices relating to sustainable development. By focusing on the acquisition of rigorous analytical skills rooted in the social sciences, this degree will provide a critical bridge between mainstream approaches to policy, economics and governance, and the pursuit of sustainable development goals. Students will build a core skill set in sophisticated applied policy, economics, and systems analysis. Specific learning objectives included in the proposal are below.

- Ability to articulate the historical, theoretical, and empirical foundations of sustainable development.
- Ability to comprehend and critique contemporary sustainable development theory and practice, domestically and internationally.
- Ability to communicate and translate science into policy and practice to multiple audiences.
- Ability to develop appropriate indicators to measure the status and progress of stakeholder toward sustainability and resilience, and identify the factors that contribute to their design and utilization.
- Ability to utilize appropriate methodologies and tools to investigate and analyze the application of sustainable development goals from local to international scales.
- Ability to design and implement stakeholder engagement for sustainable development planning and projects.
- Ability to work across constituent and disciplinary groups to facilitate movement toward sustainable development goals.

Justification and Evidence for Demand
In 2006, then-Provost John Bramley issued a report on public policy research at UVM, and concluded that despite substantial depth and expertise in a number of policy areas, policy research at UVM was "poorly coordinated and largely unpublicized" and there were significant possibilities for "more robust engagement of students in policy work, simultaneously advancing our educational, scholarly and outreach mission." The lack of a graduate program in policy areas where UVM has existing strengths, as well as the lack of a research institute to coordinate efforts on behalf of faculty and students conducting research in those policy areas, has made it more challenging for UVM to meet its obligation to play a significant role in policy research for Vermont, the nation, and the global community.

The need for such collaborative policy research has been widely noted in the strategic plans of the National Science Foundation in their calls for more "convergence" scholarship (NFS, 2018), the United States Department of Agriculture's focus on sustainable agriculture and rural livelihoods, embedded within the long-term plans of national governments (Townsend and Kunimoto, 2009), and in federal level investments in performance management and measurement systems (Metzenbaum, 2010).

There is also a compelling need for new graduate programs such as the proposed SDPEG PhD to meet growing international areas of interest. At the onset of the United Nations Decade of Education for Sustainable Development 2005-2014, a comprehensive study of current practice and future development relating to sustainable development in higher education concluded that more graduate programs were necessary in order to prepare leaders with the skills required to cope with increasing threats to sustainable development. A recent UN General Assembly report asserted that "Sustainable and inclusive societies can be brought about only through policy, investment and governance frameworks that adopt people-centered, rights-based holistic and multi-stakeholder approaches in which all voices are heard – including those of rural people, women, youth

and smallholder farmers… Consistent and specific actions and governance arrangements at all levels can be put into effect to make national and local actions efficient, to boost learning processes and stimulate synergies, to address trade-offs and to implement risk prevention mechanisms. Working alongside local institutions such as women's groups and water-user groups, prioritizing grassroots, and even household-level interventions, offers the most scope for addressing rural actors' rights" (UN General Assembly, 2018).

Relationship to Existing Programs
Currently, there are no doctoral programs at UVM that focus specifically on preparing students in applied public policy, economics or governance to study and work across institutional boundaries. While sustainable development can be a focus of doctoral dissertations in some PhD programs (e.g. Plant and Soil Science, Food Systems, Natural Resources, and the engineering fields), none of these programs offers explicit focus and expertise around the transdisciplinary advancement of sustainable development from a holistic, systems perspective, providing background skills in policy, economic and governance dimensions. The proposed program will complement other doctoral offerings, including the PhD in Natural Resources and the PhD and EdD in Educational Leadership and Policy Studies.

The closest institution offering a PhD in Sustainable Development is Columbia University, which only accepts six to nine new students per year, but has over 100 applications. Other institutions in the US that offer PhD programs with "sustainability" or "sustainable" in their titles include the University of California, Los Angeles (PhD in Environment and Sustainability) which reports ~145 applicants per year, Rochester Institute of Technology (PhD in Sustainability), Arizona State University (PhD in Sustainability), Michigan State University (PhD in Community Sustainability), Northern Arizona University (PhD in Earth Sciences & Environmental Sustainability), the University of South Dakota (PhD in Sustainability), and the University of Alaska, Fairbanks (PhD in Natural Resources and Sustainability). Upon review of the curricula offered by these institutions, the proposers indicate that the interdisciplinarity of the new SDPEG PhD offers a robust alternative to discipline specific programs, technology-centric programs, and programs that include more generalized but applied focus on sustainability. The proposed new SDPEG PhD will provide an intermediate ground between disciplinary focus and applied focus by providing students with both a rigorous grounding in policy, economics and governance theory and methods, and contemporary international to local efforts to advance sustainable development goals.

Anticipated Impact on Existing Programs
The proposers do not anticipate that inauguration of the SDPEG PhD will have any direct effect on costs or enrollment of other units. They do expect graduate students from other units to be interested in taking the two new courses in sustainable development as electives. It is also recognized that SDPEG PhD students will very likely be taking classes outside of CALS within the context of social research methods and in pursuit of certificates of graduate study. In addition, as new graduate course offerings from the College of Arts and Sciences become available, the proposers will look to align program requirements to promote cross fertilization of academic programming.

Curriculum
Completion of the proposed SDPEG PhD will require a minimum of 75 credits (30 core credits, 24 specialization credits, 21 dissertation research credits); specific course work requirements are provided in the table below. The core curriculum provides students with an extensive survey of existing conceptual models

and analytical tools to describe, evaluate, and design public policies in complex economic and governance systems. Students will obtain a solid background in contemporary research methodologies, exposing them to a range of methods, from narrative and textual analysis, to advance linear statistical analysis, to nonlinear complex adaptive systems modeling techniques. Students will deepen their expertise by taking a specialized course in one or more methods. The core curriculum also exposes students to the role that values and ethics play within policy processes inherent to mature and emerging democratic societies. Depth in a specific area will be achieved through completion of one of six existing Certificates of Graduate Study. Students that have completed appropriate masters-level courses may transfer nine to 24 credits in towards the specialization credits requirement.

Required Courses (3 credits each)	
Policy & Governance	
PA 306	Policy Systems
CDAE 371*	Sustainable Development Policy & Governance
Economics	
CDAE 370*	Political Economy of Sustainable Development
CDAE 354	Advanced Microeconomics
Social Science Analytics	
PA 303 / CDAE 351	Advanced Research Methods
CDAE 359	Econometrics
CDAE 335 / FS 335 CSYS 300 EDFS 347 EDLP 429 EDLP 439 GEOG 281 NR 346 PA 308 PA 311 PA 317	One additional methods course
Professional Development	
CDAE 376	Communicating Science
PA 380	Policy Internship
CDAE 400*	PhD Seminar (3, 1 credit offerings)
Specialization Credits (minimum of 24 total)**	
Transfer credits (up to 24)	

UVM Certificate of Graduate Study (15 to 18 credits)
   - Agroecology
   - Community Resilience and Planning
   - Complex Systems and Data Science
   - Ecological Economics
   - Public Health
   - Sustainable Enterprise	

*New course; approved up to the level of the Provost in Courseleaf

**Students may fulfill the 24 credit minimum via a mix of approved transfer credits and courses taken one of the Certificates of Graduate Study. Students that do not have enough approved transfer credits to meet the 24 credits through a Certificate of Graduate Study will take additional graduate-level courses in their area of specialization.

Other Requirements
Teaching: To fulfill the Graduate College teaching requirement, all candidates will acquire appropriate teaching experience in the field of sustainable development policy, economics, and governance prior to the award of the degree. The specific nature of the teaching assignment will be determined in consultation with the student's advisor and studies committee.

Comprehensive Exam: A comprehensive exam will be required in accordance with doctoral program expectations. Exam questions will be devised by the student's Studies Committee around the time of the dissertation proposal defense. A detailed assessment plan was included in the proposal.

There is no specific language requirement for the SDPEG Program. However, students will be encouraged to acquire language proficiency in the language/culture where research performed internationally may require it.

Admission Requirements and Process
All students must meet the requirements for doctoral study as outlined by the UVM Graduate College. Application materials will include GRE scores, sufficient GPA, statement of purpose, and letters of recommendation. To be eligible for acceptance into the proposed SDPEG PhD, candidates must have completed a master's degree in public policy, public administration, economics, natural resources, engineering, ecology, food systems, political science, or a closely related field. Those with a STEM background may be drawn to this PhD if they seek to apply their background in training in a STEM field toward the study and/or implementation of sustainable development goals.

The Director and an Admissions Committee for the proposed program will review and recommend applicants for admission. Applicants will be highly encouraged to establish contact with at least one participating faculty member whose research interests align with their interests prior to applying.

Anticipated Enrollment
The proposers estimate the program will begin with a small, selective cohort of three to five students per year. This mirrors the scale of existing PhD Programs in Food Systems and Plant and Soil Science. As the program becomes established, the proposers anticipate adding two students per year until they have a stable cohort of 12 to 14 students enrolled at any one time, spread out among four years to completion.

Advising
Faculty mentors will assume responsibility for mentoring and advising students and keeping track of their progress. These obligations will be clarified in work plans as per union contract and with the consent of departmental chairs. The coordinators of the Certificates of Graduate Study will provide advising support in matters pertaining to certificate completion.

Assessment Plan

The proposed SDPEG PhD will be evaluated routinely by the Director and annually by a Faculty Governance Committee comprised of the participating faculty. The Faculty Governance Committee will assist the Director with admissions, curriculum, student evaluations, etc. and meet on a regular basis over the course of each academic year. Metrics that will be used include, at minimum, the measures below. Other metrics may also be added as the program becomes established.

- Identification and review of doctoral-level faculty, including background and experience appropriate to engage in doctoral-level instruction
- Identification of faculty resources, including additional support for faculty to plan courses (e.g., released time, etc.)
- Routine review of student recruitment efforts and processes
- Annual review of numbers of applicants, admissions, enrollments, degree recipients, time-to-degree, attrition
- Annual review of cost of the program to students, amount and type of financial aid offered, and any student debt levels, as needed
- Annual review of post-degree job placement and employment and/or academic (e.g., post-doctoral study) arrangements of graduates
- Annual review of program costs and funding sources that are used to finance the program, including calculation of costs per degree awarded
- Annual review of external public and private support, including grant applications and grant awards, and of internal university
- Annual review of the extent to which the programs are fulfilling state needs for the preparation of policy professionals in environmental, educational, and health arenas
- Annual review of the evidence of the effect(s) graduates are having on the state, regional, national, and international policy communities
- Annual review of approval and governance processes (e.g., processes for governance, changes in curriculum, program reviews, program decisions, role of advisory group, etc.)
- Development of appropriate procedures for review of curricula, including feedback from stakeholders and revision, as appropriate

Staffing Plan, Resource Requirements, and Budget

In addition to CDAE faculty, the proposed SDPEG PhD will include faculty from the Economics, Geography, and Political Science departments in the College of Arts and Sciences. These faculty have long-standing expertise in such important topics as environmental governance, social equity and economic systems, and migration and immigration policy. As the SDPEG PhD evolves and establishes itself, faculty from other units will be invited to participate.

Faculty workloads will be adjusted to ensure that the new required courses are taught in a timely manner. Using the approach where several faculty members are able and competent to teach these courses, flexibility in the offering of their suite of courses taught is possible. Other courses are already taught and have capacity for three to five additional graduate students. Administrative support will be absorbed into the workload of the CDAE graduate student support position. Doctoral students enrolled will provide teaching assistance in undergraduate courses, easing the teaching burden of faculty in up to five courses, given expected enrollments.

The program will be headed by a Director who is a senior faculty member with a national reputation in sustainable development. The Director will be appointed for a five-year renewable term of service.

Policy, governance, economics, and sustainable development research materials, including an array of policy journals, are available through the UVM library system. A comprehensive review of library resources was undertaken by Library Professor Trina Magi and colleagues.

Supplemental funding has been received from the Graduate College and Office of the Vice President of Research. Additional sources of funding include: 1) tuition collected from students' core courses, 2) external grant support of faculty involved in mentoring students in the program, and 3) internal UVM awards for graduate students. A detailed budget was submitted with the proposal.

Evidence of Support
The proposal for the new SDPEG PhD was approved by the CALS Curriculum Committee and CALS Interim Dean, Jean Harvey. Letters of support were also received from:
- Graduate College Dean, Cindy Forehand and Vice President for Research, Richard Galbraith
- College of Arts and Sciences Dean Bill Falls
- Rubenstein School of Environment and Natural Resources Dean, Nancy Mathews
- Director of the GUND Institute for Environment, Taylor Ricketts
- Grossman School of Business Dean, Sanjay Sharma
- College of Education and Social Services Dean, Scott Thomas
- College of Engineering and Mathematical Sciences Dean, Linda Schadler
- Larner College of Medicine Dean, Richard Page
- Director of the Graduate Program in Food Systems, Amy Trubek
- Interim Chair Plant and Soil Science, V. Emesto Méndez
- Director of the Public Health Program, Jan Carney
- NASPAA Executive Director, Laurel McFarland

Summary
The proposed Sustainable Development Policy, Economics and Governance (SDPEG) PhD provides a transdisciplinary doctoral education in the policies, practices, and theories of sustainable development. By offering a core curriculum that includes applied policy and economic analysis, governance and process design, social science methods, and professional skills development, graduates will be capable of conducting original, applied research that is designed to support sustainability and resiliency across social, ecological, and technical systems. Given the challenges faced world-wide, there is an elevated the need to focus on sustainable development goals, and the demand for programs like this is high as evidenced by the number of applications received by other universities for similar programs. The proposed SDPEG PhD capitalizes on the expertise of UVM faculty and distinguishes itself from related programs through its transdisciplinary approach. Faculty from across UVM will be involved in the proposed PhD, increasing opportunities for collaboration. Based on all of this, the proposed SDPEG will be an excellent addition to UVM's graduate offerings.