

Transdisciplinary Approach in Development Studies

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Abstract: This paper traces the origin, evolution, and the propositions made by the framers of the transdisciplinary (TD) concept. It reviews the body of work of the various applications of the TD approach in the human sciences as in the twinning of medical sciences and the social sciences; biodiversity; agriculture sciences and development; and agriculture, food, and nutrition. Another application of the TD approach is discussed in the context of innovation systems for development studies with focus on sustainable community development and food security. The experiences of the College of Public Affairs and Development (CPAf), University of the Philippines Los Baños (UPLB) in formulating and applying the TD approach to development problems are highlighted. Recommendations are given on the integration of TD in curricular programs of CPAf.

Keywords: *Transdisciplinary (TD) research, public affairs, innovations system, sustainable community development, food security*

I. Introduction

This article expounds on the relevance of transdisciplinary (TD) approach in the field of public affairs and development, which

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is the multidisciplinary anchor of the youngest college of the University of the Philippines Los Baños (UPLB), that is, the College of Public Affairs and Development (CPAf). CPAf aims for distinctive excellence in development studies and governance to support national development goals in the agriculture and rural sectors and in communities in transition. Among its mandates is to develop, refine, and access a body of knowledge, theories, and principles to make public affairs and development a *transdisciplinary field of study* and to position the field at a cutting edge in local and national development efforts. Through transdisciplinary approaches, CPAf shall develop human and institutional capacities in local development policy, governance, and community development consistent with the college's values and traditions while taking into account the demands of globalization (CPAf Creation Document 1998).

For most academics and development researchers in the Philippines, the TD approach is still a novel concept. Thus, this paper will elucidate on the origin and evolution of the term both in theory and in practice; explain the propositions found in the literature to enhance TD research; cite applications of the TD; and discuss how TD approach drives research at CPAf.

II. Origin and Evolution of the Transdisciplinary (TD) Approach

Jean Piaget introduced the use of TD in 1970. In November 1994, the International Center for Transdisciplinary Research (CIRET) adopted the Charter of Transdisciplinarity at the 1st World Congress of Transdisciplinarity in Convento da Arrabida, Portugal (Wikipedia 2012a). CIRET clarifies that transdisciplinarity is radically distinct from interdisciplinarity. Interdisciplinarity is concerned with the transfer of methods from one discipline to

another, allowing research to spill over disciplinary boundaries while staying within the framework of disciplinary research.

TD began with a pessimistic overview of the world in the late 20th century; the world was complex and full of conflicts. Early proponents (Lattanzi 1998; Klein et al. 2001) of the TD approach viewed this as an area of research and education that addresses contemporary issues, which could not be solved by one or even a few points of view. It brings together “academic experts, field practitioners, community members, research scientists, political leaders, and business owners among others to solve some of the pressing problems of the world, from the local to the global levels. TD studies emphasize engagement, investigation, and participation to address present-day issues and problems in a manner that explicitly destabilizes disciplinary boundaries while respecting disciplinary expertise. These studies are built around three key concepts: transformative praxis, constructive problem-solving, and real-world engagement.”

The advocates of TD studies argue that their propositions fit naturally into the 21st century world. This world, as claimed, requires a contextualizing of knowledge in order to address complex issues (such as global warming) and a collaboration across academic disciplines that includes non-academics in solving problems (Klein et al. 2001, Nicolescu 2002). Henceforth, current advocates have refined and clarified definitions and practice of TD research.

Transdisciplinarity is defined by Nicolescu (2008), considered to be the father of the TD approach, through three methodological postulates: the existence of levels of reality, the logic of the included middle, and complexity. As the prefix “trans” indicates, transdisciplinarity concerns that which is at once between the disciplines (i.e., the interface), across the different disciplines, and beyond each individual discipline. It addresses complex problems and their diversity of perceptions; it recognizes that

abstract and case-specific knowledge are linked; and it acknowledges that practices promote the common good (Hirsch Hadorn et al. 2008).

Another critical defining characteristic of TD research is the inclusion of stakeholders in defining research objectives and strategies in order to better incorporate the diffusion of learning produced by the research. Collaboration among stakeholders is deemed essential – not merely at an academic or disciplinary collaboration level, but with people affected by the research and community-based stakeholders. This way, TD collaboration becomes uniquely capable of engaging in different ways of knowing the world, in generating new knowledge, and in helping stakeholders understand and incorporate the results or lessons learned from the research (Wickson et al. 2006). Transdisciplinary research is not antagonistic but complementary to multidisciplinary and interdisciplinary research, as explained by Nicolesco (2008).

III. Propositions of TD: A Guiding Framework

The literatures also rightly state that the debate on transdisciplinarity is still fairly young and that the process of TD research is still being developed. A group of like-minded TD professionals had published a handbook with fifteen propositions to enhance TD research (Wiesmann et al. 2008). This was an attempt to stimulate the debate on, and the development of, TD research. These propositions, summarized in Appendix 1, were grouped into three: the definition, scope, and process of TD research; some of the most persistent stumbling blocks in TD practice; and the cornerstones needed to face the scientific, the institutional, and the societal challenges. The following are the highlights of these propositions as formulated by Wiesmann et al. (2008).

a. Scope, Process, and Outcomes of TD Research

TD transgresses boundaries between scientific disciplines and between science and other societal fields. It includes deliberation about facts, practices, and values. It is an appropriate form of research when searching for science-based solutions to problems in the life-world with a high degree of complexity in terms of factual uncertainties, value loads, and societal stakes. TD implies that the precise nature of a problem to be addressed and solved is not predetermined and needs to be defined cooperatively by actors from the science- and the life-world.

Such was practiced in a 1994 research on sustainable agriculture and natural resource management based in the Philippine uplands (Rola 2011). To refine problem definition, as well as the joint commitment in solving or mitigating problems, TD research connects problem identification and structuring, searches for solutions, and brings results to fruition in a recursive research and negotiation process. Current use of adaptive management is an application of this proposition. TD thus dismantles the traditional sequence leading from scientific insight to action.

As for the nature of problems addressed in TD research, the participating disciplines and competencies from the natural, technical and social sciences, and the humanities, as well as from the life-world cannot be pre-defined, thus no blueprint is expected to be drawn. Determined during the research process are the bodies of knowledge that have to be integrated, which account, produce, and integrate systems knowledge, target knowledge, and transformation knowledge (Wiesmann et al. 2008). Just like the interdisciplinary research, TD research is not meaningful without sound disciplinary contributions.

b. Dealing with Stumbling Blocks in TD Practice

Wiesmann et al. (2008) also listed the six stumbling blocks in TD practice: participation and mutual learning; integration and collaboration; values and uncertainties; management and leadership; education and career building; and evaluation and quality control.

According to Wiesmann et al. (2008), participatory processes require carefully structured, sequenced, and selected negotiations and interactions. Building on approaches of mutual learning that bridge roles and positions without dissolving them is a promising entry point to goal-oriented participation. Second, collaborative efforts of integration take into account the recursive nature of TD research. Combining different means of integration, i.e., developing joint theoretical frameworks, applied models, and concrete common outputs – in an iterative or circular process – has proven to be particularly successful. There should also be a productive balance between structured collaboration and vested interests by participating partners and disciplines. Third, in order to give sufficient attention to values and stakes at all stages of TD processes, collaborations and negotiations should be dominated by a mutual learning attitude, not by positions. Reflexivity is also the core means for dealing with uncertainties and the outer boundaries of knowledge resulting from TD endeavors.

Fourth, leading TD projects primarily imply finding a satisfactory balance between periods of intense collaboration with clearly defined joint outputs and periods where deepened disciplinary and multi-disciplinary contributions can be elaborated. This balance of periods is best supported by management services that simultaneously ease administrative tasks for participants; provide clearly structured and timed means of communication, integration and reflexivity; and support internal and external

recognition of all contributors. Fifth, TD training and education are best developed in close connection with the disciplines of origin. Related career building can be supported by careful planning and sequencing of outputs targeting the reference systems of the original discipline and the enhanced peers of transdisciplinarity.

Lastly, Wiesmann et al. (2008) propose that evaluation of TD research has to go beyond traditional reference systems. It should include qualifying integration and collaboration of disciplines and stakeholders, the recursive design of the research process, and the way the project is based on, and can provide input to, scientific knowledge and societal problem handling. To strengthen internal quality control efforts, researchers should concentrate on finding the delicate balance between respecting specific competence and transgressing them in constructive and critical dialogue within TD teams.

c. Cornerstones for Enhancing TD Research

The last set of propositions by Wiesmann et al. (2008) pertains to the cornerstones needed to face scientific, institutional, and societal challenges. It was proposed that good and concrete TD practice must be supplemented by efforts done at its scientific foundations and for scientific recognition. These must go beyond just systematizing TD research procedures and aim at theoretical, methodological, and topical development and innovation at the interface with participating disciplines – to benefit both sides. Furthermore, in order to enhance TD research, its scientific foundations and its innovative potential for participating disciplines, the institutional position in science and academia has to be strengthened. This may mean incorporating aspects of transdisciplinarity into research, curricula, and career building within established disciplinary institutions. It may also include promoting specialist TD institutions (as is the mandate of CPAf).

The growing network of peers will need to play a key role, allowing TD practice to be promoted more proactively by the scientific community.

Wiesmann et al (2008) urged the scientific community to constantly renew the debate on the role of values in research. Contributing to solving life-world problems through TD research, according to Wiesmann et al. (2008), requires science to be conscious and explicit in terms of values and in the boundaries of knowledge and findings.

TD and Participatory Research (PR)

In development studies, one approach that is closely related to TD is the participatory research (PR) approach, though this is also considered to be one of the stumbling blocks in the former. Participatory process is a subset of the whole TD approach. Its practice embedded in the transdisciplinary approach requires carefully structured, sequenced, and selected negotiations and interactions, which sometimes are not met, thus becoming a stumbling block. Its defining characteristic is the involvement of relevant stakeholders (e.g., farmers, fishers, extension officers, policy makers, etc). Stakeholders, for example, may help define problems and issues for research, collaborate in data gathering and analysis, and/or apply the research findings (Neiland et al. 2006). But how participatory is participatory development was also the issue raised by foremost Filipino sociologist Castillo (1983).

The participatory approach to agriculture and development studies, in particular, assumes that rural people have the in-depth local knowledge about their circumstances and production systems and this can be used to identify researchable constraints to development (Turrall n.d.). Proponents of this approach argue that

involving local people in the research process increases the relevance and applicability of research findings and improves their delivery to the end users. Furthermore, literature also cites that participation can change the nature of research, reducing the need for high levels of human and financial resources. Participation also encourages communication and the sharing of information among stakeholders and researchers who facilitate the R&D process.

On the other hand, TD is ideal in dealing with complex problems, such as climate change and food security. TD involves many disciplines and practitioners of various fields in conceptualizing and solving the problem. It needs more than local knowledge, hence the complex models developed from both science and the practitioners are the domains of the solution set. Clearly, participatory research is one of the components of TD.

IV. Applications and Advancement of TD Approach

When can one say that a particular effort is transdisciplinary? The applications shown in the literature note the following elements of a TD approach: 1) it is systems-oriented, thus it combines a variety of frameworks; 2) it is multistakeholder with both academic and non-academic partners solving problems together; 3) it is science-based, thus it depends on scientific information, pointing to the major role of the scientists and their challenge of further developing the TD framework; and 4) it addresses real societal problems.

As a research strategy, TD crosses many disciplinary boundaries to create a holistic approach. It applies to research efforts focused on problems that cross the boundaries of two or more disciplines, such as research on effective information systems

for biomedical research (bioinformatics). It can refer to concepts or methods that were originally developed by one discipline but are now used by several others, such as ethnography. Ethnography is a field research method originally developed in anthropology but now widely used by other disciplines.

This section highlights some applications of TD in various fields.

4.1 Human Sciences: Health and the Social Sciences

Health and social science collaboration is one practical application of TD research. A TD approach can provide a systematic, comprehensive theoretical framework for the definition and analysis of the social, economic, political, environmental, and institutional factors influencing human health and well-being. The academic and career challenges for such researchers, while considerable, may be overcome since there is now a new flexibility in research-supporting organizations to encourage new ideas in international health, such as that of essential national health research (Rosenfield 1992).

TD research would firmly ground the particular health condition under analysis in its social and economic setting. The health decision-maker can reach across sectors and disciplines to work with his or her counterpart in agriculture, education, economics, planning, and finance to strengthen the basis for sustainable health and development policies. This approach and its outcomes could also lead to a new academic enterprise where more intensive and extensive scholarship would be focused. The scholarship will help develop a general conceptual framework as the underpinning for research and educational programs. TD research would not only sustain existing collaboration between social and health scientists. More importantly, it would build a solid branch of knowledge that would continue to extend and illuminate

understanding and improvement of the human condition (Rosenfield 1992).

Another TD initiative in the health sector is the Transdisciplinary Research on Energetics and Cancer (TREC), a major scientific research effort studying obesity and cancer, funded by the National Cancer Institute (NCI) in the US (NCI 2012). This center studies obesity and cancer because existing research shows that many cancers are linked with obesity. Reducing these cancers requires the unfolding of the link between obesity and cancer. Scientists in the center are conducting research to learn how the combined effects of obesity, poor diet, and low levels of physical activity increase cancer risk. They are also searching for effective ways to prevent and control obesity.

4.2 Biodiversity Application

TD is also being practiced in addressing biodiversity issues in Europe. The series of workshops organized by the German-based Institute for Social-Ecological Research (ISOE) in cooperation with the European Platform for Biodiversity Research Strategy (EPBRS) and the Belgian Biodiversity Platform aim to explore ways to further increase the capacities of transdisciplinary biodiversity research in Europe. It brings together researchers and experts, representatives, and decision-makers from European institutions and research funding agencies, as well as members from civil society and the private sector.

A summary of their recommendations to further promote transdisciplinary biodiversity research include: 1) Scientists have a role to play in raising awareness on the importance of biodiversity as a transdisciplinary issue. The biodiversity community needs people who are able to bridge between worlds, both science and advocacy, to get transdisciplinary biodiversity topics on the European research agenda; 2) Environmental policy representatives at national

(Belgium) and European level have to open up to and interact with other sectors to better advocate for global biodiversity agreements and mobilize more funding for transdisciplinary research on biodiversity; 3) Scientific academic training should provide means and opportunities to train new professionals to become the “in-between” links. Current educational and institutional frameworks need to be adapted to provide such training and career opportunities; 4) Innovation should be understood in a broader sense than technology and products with market value. Research is needed on innovative ways to increase sustainable use, recycling of natural resources, and learning from natural processes; and 5) The biodiversity community needs to reinforce its identity and build up larger influential groups to be able to advocate more efficiently at national and European levels (ISOE 2011).

4.3 Agriculture Science and Development

Another noted application of TD research is on agriculture and development. For instance, Hajdu et al. (2012) showed how agricultural interventions in South Africa have failed to deliver the promised poverty reduction for rural smallholders using ecological economics, livelihood studies, complex system methodology, and discourse theory in a TD fashion. These methods and frameworks were used to investigate the underlying reasons behind such failures. The mismatch between local realities and program management was found to be a central cause of failure. Lack of responsiveness to local realities within the program resulted in tractors being sent to plough fields across a river with no bridge, leading locals to comment ‘but tractors can’t fly.’ The neoliberal discourse in South African development policy was found to be a crucial factor behind such omissions (Hajdu et al. 2012).

4.4 Agriculture, Food, and Nutrition Security

The systems approach to the study of food and nutrition security is another application of the TD research. A systems framework consisting of technology and policy analysis in sector governance, access to resources, production, and markets can lead to both food and nutrition security. This approach can also help explain why despite national food security programs, malnutrition and nutrition insecurity at the household level are prevalent. Food and nutrition security can only be achieved through an integrated framework of analysis in food and nutrition security planning and programming (Velasco et al. 2012). The latter study urged for a holistic perspective and for the agriculture, food, and nutrition sectors to come together to solve the problem in a scientific manner.

4.5 Institutional Efforts to Advance TD Research

Continuing TD works are found mostly in Europe, though there are also American and Australian groups engaged in the field. The International Center for Transdisciplinary Research, based in Paris, is a central force in the propagation of transdisciplinary studies. Td-net: network for transdisciplinarity in sciences and humanities, at the Swiss Academy of Sciences, acts as a resource for writing and work on TD topics. The Russian School of Transdisciplinarity is focused on creating a unified methodology for transdisciplinary studies to teaching it in institutions of higher education as an independent scientific discipline (Wikipedia 2012b).

Programs on Transdisciplinary Studies in the United States have been created at the University of North Carolina, Woodbury University, New York University, Claremont Graduate University, and Parsons New School for Design. There is also the Centre of Transdisciplinary Studies for Development at the University of Trás-os-Montes and Alto Douro in Portugal.

In 2009, the University of Vermont (UVM) in the US embarked upon an unprecedented University-wide conversation - the Transdisciplinary Research Initiative, or TRI - to strategically advance its national role as a premier small research university (University of Vermont [UVM] 2012). Led by UVM administrators, the Faculty Senate and faculty experts from across campuses, the TRI helped map UVM's existing and emerging transdisciplinary strengths, develop its distinctive national and international reputation for research and scholarship, and strategically invest resources to create new knowledge, advance economic development, and engage their communities. As a result of the TRI process, three "Spires of Excellence" were named: Complex Systems, Food Systems, and Neuroscience, Behavior and Health.

4.6 Dissemination of TD Research Outputs

At present, there are at least two international journals dedicated to the development of the body of knowledge on TD research. These are the Journal for Transdisciplinary Research in Southern Africa and the International Journal of Transdisciplinary Research.

The Journal for Transdisciplinary Research in Southern Africa aims to create knowledge with the collaboration of the formal sectors of the natural and human sciences as base. Over and above this, it intends to focus on levels of knowledge found at the grassroots level. It is important to explore this knowledge because it becomes the groundwork for further knowledge, which is often not confined to a fixed formal discipline or area of knowledge (North-West University Institutional Repository [NWU] 2012).

On the other hand, the International Journal of Transdisciplinary Research (IJTR) extends and integrates the study

of economics with disciplines within the natural and social sciences, as well as the humanities. IJTR contains materials on alternative frameworks and argues for the development of a unifying vision of an economic paradigm that realistically portrays economic systems. If science wishes to contribute to solving real world issues, transdisciplinary collaboration and communication are necessary.

IJTR topics include epistemological issues such as: 1) sustainability, (2) social multi-criteria evaluations, 3) ecological economics and the biophysical foundations of economics, 4) systems research, and 5) complexity and post normal science. The Journal is for the constructive argument and the development of alternative ways to govern sustainability. Furthermore, the Journal seeks research articles from colleagues in fields other than economics on how economic systems really work (International Journal of Transdisciplinary Research [IJTR] 2012).

V. TD Approach in the Context of the Philippine Public Affairs and Development

5.1 TD and the Innovation Systems Framework

In rural Philippine setting, as in the rest of rural areas in developing countries, the TD approach is most suitably fitted within an innovation systems framework. This framework embeds the institutional changes in response to the overall community level changes now happening in response to urbanization, globalization, and decentralization challenges. The innovation systems framework demonstrates the importance of studying innovation as a process in which knowledge is accumulated and applied by heterogeneous agents through complex interactions that are conditioned by social and economic institutions (Spielman 2005). Within the innovation system perspective, a lot of other factors explain how society generates, disseminates, and utilizes knowledge, and how such

systems can be strengthened for greater social benefit (Hall et al. 2003).

Literatures on the more theoretical innovation systems represent a significant change from the conventional, linear perspectives on agricultural research and development (R&D). These provide a framework for the analysis of complex relationships (a TD element) and innovative processes that occur among multiple agents, social and economic institutions, and endogenously determined technological and institutional opportunities. The emerging body of empirical literature is equally significant in that it provides analysis of different forms of cooperation (e.g., research partnerships, knowledge networks, and industry clusters) among state and non-state actors (e.g., public research organizations, private firms, and producer organizations) in various sectoral, spatial, and temporal contexts (Spielman 2005). There is also a shift in the focus of policy from examining the determinants and consequence of research to capacity development where emphasis is on strengthening networks of users and producers of knowledge (Velho 2002).

TD and Agriculture and Community Development

Experiences in implementing agriculture and rural development programs reveal the limitations of a single disciplinary focus to better appreciate the social dynamics and complexities of interactions of factors that affect change, and ultimately, development. In the past, the role of the social sciences in agriculture and community development was limited to the understanding of farmers' behavior in the adoption of new technologies. Agricultural economists ably dealt with profitability concerns as plot level research centered only on yield and profit comparisons between the new technology and the farmers' practice. Agricultural extension focused mainly on technology diffusion at the farm level. As the unit

of analysis itself has evolved from plot to farm and from households to communities, the approach to complement academic programs in social science will also have to be reconfigured. The contemporary study of community development leads to the understanding of the interrelationships among policies, institutions, and governance of resources that can further lead to social development.

Agricultural managers as development managers must consider the optimal relationship between and among productivity and profit, sustainability, societal needs, and institutions, as illustrated in Figure 1. While one still studies the yield and profit effects, the paradigm has now expanded to include concurrently the impact of modern agriculture on natural resources, and the role of institutions in attaining sustainable community development. Development analysts have long recognized the need for a broader multidisciplinary/interdisciplinary approach. Now, transdisciplinary approach can better understand and explain the interaction of the technical, social, cultural, economic, institutional, and environmental factors that affect agriculture and community development. Decisions to participate in collective action and to maximize the benefits from interventions, as well as social relations among the key development actors/stakeholders, also need unconventional methods of study.



Figure 1. Factors to consider in agriculture and community development decision-making (Hall et al. 2003)

TD Approach to Food Security Research

Integration of the various disciplines to achieve food security is a paramount concern of an agricultural university. In solving food insecurity, one needs the integration of agriculture science, environmental science, and the study of culture, society and people, simultaneously (Figure 2).

Finally, applied social science for agriculture and community development needs to focus on institutional innovations as these social structures hasten or constrain the development process.



Figure 2. Transdisciplinary approach to the study of food security (Hall et al. 2003)

5.2 Formulating the CPAf Transdisciplinary Research Framework

Methodology

The 1998 document creating the College of Public Affairs and Development (CPAf) stipulated the following development issues to be the College's problem foci: food security, land reform and land use, governance, strategic planning, population, environment, education, agrarian and rural development, and cooperatives. In 2007, the faculty and researchers of the CPAf, through an in-house project, grouped themselves into four themes: institutions, community management strategies, science and technology policy, and social development (Rola 2007). The in-house project guided CPAf in developing a thematic framework that would help determine the niche and the boundary of its academic and research programs. CPAf research is expected to be problem-focused and with solutions derived from stakeholder participation (a TD proposition).

The four teams were tasked to review and analyze using the meta-analysis method, all the researches of CPAf students and faculty members conducted from 1998 to 2008 in each of the four themes. Further processing of identified themes and the subsequent restructuring of the College in 2011 led to a more specific identification of the two “spires of excellence” that CPAf research aims to facilitate, at least in the next five years. These are on food and nutrition systems to be the focus of policy research of the Center for Strategic Planning and Policy Studies (CSPPS) and sustainable community systems to be the transdisciplinary research focus of the Community Innovations Studies Center (CISC). These two centers are the research and extension arm of the restructured CPAf.

The CPAf Transdisciplinary R and E Framework

Two frameworks integrating the levels of expertise in CPAf (Figure 3) and highlighting CPAf's research niche (Figure 4) were also formulated in the various strategic planning workshops of the College (Rola et al. 2011). The R&E agenda of the College as suggested by the faculty should be able to tap 1) transdisciplinary, 2) institutional, and 3) individual expertise.

The first framework identifies the transdisciplinary grid to complement the research framework that will be developed. Each faculty brings his/her individual discipline into the fore. The second layer is the institutional expertise of the institute that he/she belongs to. The research will also be tailored along this, and the individual expertise will be integrated into the institutional disciplinarity. To address development problems, the third layer will be the multi-transdisciplinary approach to problem solving. Now, the individual expertise will be molded through practical applications to fit in this third layer.

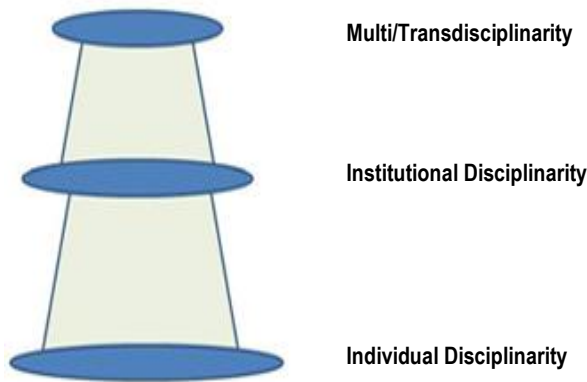


Figure 3. Cake framework: Levels of disciplinarity/expertise combining competencies in CPAf from a systems perspective (CPAf Strategic Planning Workshop Discussions, December 2010)

The second framework (Figure 4) attempts to lay down the relationship of the four themes that were originally identified as CPAf's research niches to contribute to social development.

The framework identifies the type of scholarly response that CPAf needs to develop to be relevant to the demands of developmental problems, specifically on food and nutrition and on sustainable community development. The goal is to achieve social development, and ultimately, sustainable development. The methodological and theoretical development will be in the fields of policy/governance, institutional analysis, and delivery systems. Note that CPAf needs to work with the technical colleges that will formulate technological solutions to the defined development problems. The transdisciplinary expertise grid is indicated as a base of the framework to illustrate complementation of such a basic resource in the research problem formulation and implementation.

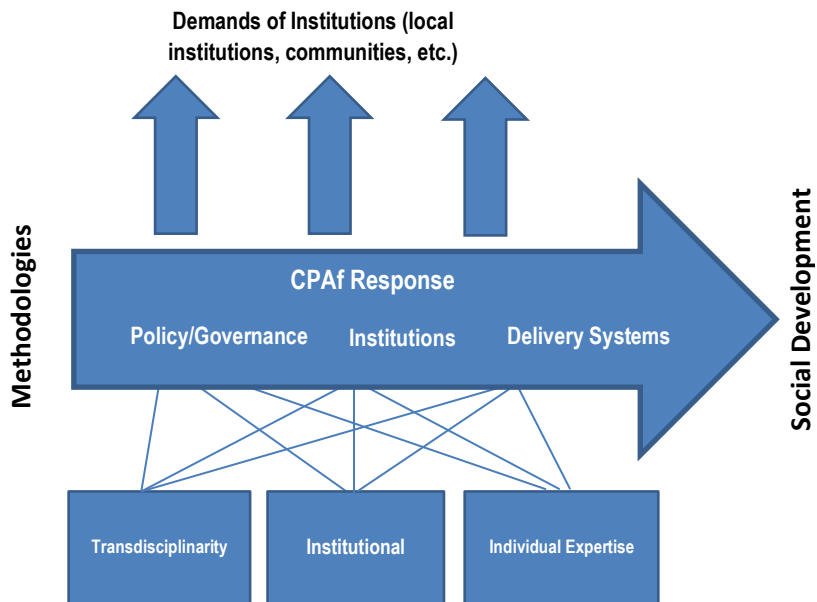


Figure 4. CPAf's Research Framework (CPAf Strategic Planning Workshop Discussions, December 2010)

CPAf needs to nurture more collaborations in research activities, but this can be done through the two centers doing TD research towards the resolution of the two focal development problems described above. Activities such as R&E planning workshops and round table discussions should also be a continuing research exercise. To enhance the TD research capability, CPAf's faculty and staff should get involved in other colleges' researches, and vice-versa. The UPLB management should be facilitative in this aspect.

5.3 Experience of the CPAf: Lessons and Challenges in the Practice of TD

TD research at UPLB started even before CPAf was born. The following are examples of the TD research efforts done by the College in the two realms of food security and sustainable community development.

Sustainable Upland Community Development

This was a study of an upland community in transition chronicled through the aegis of the USAID-sponsored project, Sustainable Agriculture and Natural Resources Management-Collaborative Research Support Program Southeast Asia (SANREM CRSP SEA) conducted from 1994 to 2009 in Bukidnon. The program had four cornerstones or research design principles (Coxhead and Buenavista 2001): a landscape approach, interdisciplinarity, inter-institutional collaboration, and participation. The grant program was designed so that maximum reliance was placed on the “ingenuity of the researchers who will do the work” (NRC 1991:5, as cited in Coxhead and Buenavista 2001). This “lack of blueprint” set the pace for an innovative work that was more process-oriented, long range, and with multiple actors (Northern scientists, Southern scientists, national officials, local officials, indigenous communities, men and women farmers, and others) having one goal in mind: to attain sustainability in upland communities amidst economic and political development.

This project had all the elements of a TD approach. One common application of the TD is the science-policy interface. In other words, TD complements applied research in problem fields characterized by complexity and uncertainty (Hirsch-Hadom et al. 2008), as in the SANREM CRSP SEA research.

Some of the unique components of this particular TD application are as follows (Rola 2011):

a) Beyond Farmer Participation

This research validates the earlier claim that participatory research is a component of TD. The research team was made accountable to the farmers when they presented their proposals to community leaders for assessment of relevance. An annual event enabled the community to learn about the progress of the research. Aside from the research, the program initiated three development activities on natural resource management with the community. Formed were the water watch group; a group that could supply agroforestry seedlings; and a group that promoted soil conservation techniques through farmer groups. In these different models, farmers and community members formed associations to monitor and manage water and soil resources, and explored opportunities for offering their services outside the municipality.

b) Partnership with Local Governments

One of the unique features of the program was the formal way of engaging the local government officials in the project activities. The mayor, chair of the environment committee of the municipal legislative body, municipal planning and development officer, and provincial planning and development officer were all part of the project staff. In this arrangement, the mayor had a clear understanding of the purposes of the project. The local government officials were also amenable to the research recommendations. If feasible, immediate actions were taken. The research alliance with the local government was successful because of the “trust and confidence” that linked the local communities and the research group. The research team exerted great effort to integrate itself into the community, and to partake of the local customs, as expected of

strangers coming to the place. Once the local government became comfortable with the set-up, the partnership flourished.

c) Capacity Building on Local Policy Analysis

Hand-in-hand with the research and development partnership with the various sectors of the community was the conduct of the local capacity building. Capacity building was done not just for generating information on agricultural technologies and management of natural resources but also for policy analysis for environmental management. Both provincial and municipal governments' elective and appointed officials were trained on policy analysis for environmental management. The knowledge from the training was important for their subsequent policy making efforts for environmental management and for program impact sustainability.

Collaborative Research, Development, and Extension for Food Security (CRDES)

This program was started in 2009 and is still an ongoing activity of the CPAf and other UPLB units. The lessons learned from this TD approach are discussed in Amit and Querijero's article (in this volume). In general, forging partnerships and collaboration to implement the program were considered to be most important (Rola et al. 2012). The CPAf professors are theorizing on the lessons and experiences learned by analyzing at least three tiers (Amit and Querijero, 2012 in this volume): 1) the partnership formation among the colleges of the UPLB from both the technical and the social science fields; 2) sustained engagement of the various collaborative institutions with their own particular mandates and activities; and 3) leadership attributes (who is in charge?) of the UPLB as a

national university in coordinating the various institutions mandated to work on food security.

Lessons and Challenges in the Practice of TD: A UPLB Perspective

Some of the lessons that were learned are as follows:

- 1) Leadership is a sensitive issue. The leader must have the moral ascendancy to be credible. He/she must be a sociable person and most of all, he/she must not assume a dominant force in theorizing and field applications. The leader must know how to blend and must respect all the points raised by the team members and partners.
- 2) There must be a champion. In each sector, the team can recognize a sector champion to work within the core team. This champion will also be able to relay the message to sector partners and beneficiaries. However, there must be an overall champion, who will sustain the activities in terms of theorizing, advocating results, assessing outputs and outcomes, and thinking forward for the next steps.
- 3) There must be clear tasking and agreement on timelines. This is to get the commitment of all partners. Ideally, a memorandum of understanding and a memorandum of agreement must be signed by all partners and their agency heads. Timelines must be observed at all times; otherwise, the program outputs will be in jeopardy.
- 4) There must be utmost respect for individual disciplines and contributions from the other sectors. The partners must be good listeners.
- 5) The team composition and creation are also tricky issues. It all starts from finding an ideal leader that has already the interdisciplinary perspective and can then just add to the effort the transdisciplinary approach. The team composition

represents the ability of the team leader to recognize what discipline will be needed at a particular stage of the work. The team creation will be the identification of the core team members who will ideally have the initial synergy to work together.

Over all, the challenge of the TD lies not in the identification of the disciplines and sector participants but on how well the team can work to deliver the outputs. This is as experienced by the researchers of CPAf and UPLB in general.

VI. Conclusions and Recommendations

The TD approach has been demonstrated to be a fitting framework for the 21st century problems such as sustainability, globalization, and decentralization. It proposes a systems approach to solving these development problems. Proponents, however, have also warned that scientific, institutional, and societal challenges can hamper the use of this approach. As was mentioned, TD practice must be supplemented by efforts at the levels of its scientific foundations, and it must have scientific recognition. This means that in academic institutions, there is a need to theorize and develop methods, topics, and innovations that can bring us at the interface of participating disciplines as well as the benefits of other societal actors.

The paper also demonstrated CPAf's efforts to use the TD approach into its research programs, highlighting the need for a strong disciplinary base by faculty and the challenge of working with the technical colleges within campus. UPLB as a whole is looking forward to the implementation of a transdisciplinary academic program, the PhD in Development Studies. In this program, the areas of discipline will have technical anchors in agriculture, forestry and the environment, while the cognates will be choices of social science courses. The PhD program aims to theorize on development

pathways of third world countries, unique from the experiences of Western countries. TD methods will also be more robustly formulated and practiced as students will be honed in systems thinking and analysis.

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Appendix 1. Fifteen propositions for enhancing transdisciplinary research (Wiesmann et al. 2008)

Scope, Process and Outcomes of Transdisciplinary Research

Proposition 1 - Definition

Transdisciplinary research is research that includes cooperation within the scientific community and a debate between research and the society at large. Transdisciplinary research, therefore, transgresses boundaries between scientific disciplines and between science and other societal fields and includes deliberation about facts, practices, and values.

Proposition 2 - Scope and Relevance

Transdisciplinary research is an appropriate form of research when searching for science-based solutions to problems in the life-world with a high degree of complexity in terms of factual uncertainties, value loads, and societal stakes. Through bridging different scientific and social knowledge components, it can significantly improve the quality, acceptance, and sustainability of such solutions. However, deliberation about facts, practices, and values are ongoing when bringing results to fruition in the life-world as well as in scientific communities.

Proposition 3 - Recursive Process

Transdisciplinarity implies that the precise nature of a problem to be addressed and solved is not predetermined and needs to be defined cooperatively by actors from science and the life-world. To enable the refining of problem definition as well as the joint commitment in solving or mitigating problems, transdisciplinary research connects problem identification and structuring, searching for solutions, and bringing results to fruition in a recursive research and negotiation process. Transdisciplinarity thus dismantles the traditional sequence leading from scientific insight to action.

Proposition 4 - Knowledge Forms

In relation to the nature of problems that are addressed in transdisciplinary research, the canon of participating disciplines and competencies from the natural, technical and social sciences, and the humanities, as well as from the life-world cannot be pre-defined. It is to be determined during the research process, which bodies of knowledge have to be integrated to take into account, produce, and integrate systems knowledge, target knowledge, and transformation knowledge.

Appendix 1 continued...

Scope, Process and Outcomes of Transdisciplinary Research

**Proposition 5-
Contextuality and
Generality**

Transdisciplinary research is by necessity shaped by concrete problem contexts and related societal settings, and its results are basically valid for these contexts. However, taking into account the prerequisite of contextualisation, transdisciplinary research also aims at generality by providing insights, models, and approaches that can be transferred to other contextual settings after careful validation and adaptation.

**Proposition 6-
Specialization and
Innovation**

The quality of transdisciplinary research is bound by sound conceptions of integration, and thus, requires development of its own form of specialization. However, transdisciplinary research is not meaningful without sound disciplinary contributions, and it has the potential to stimulate innovation in participating disciplines. Bringing this potential to fruition requires an emerging college of peers able to bridge disciplinary and transdisciplinary specialization.

Dealing with Stumbling Blocks in Transdisciplinary Practice

**Proposition 7-
Participation and
Mutual Learning**

Participatory processes in transdisciplinary practice require carefully structured, sequenced, and selected negotiations and interactions. The different resources, goals, and values at stake and their social representation in society and science need to be considered. Building on approaches of mutual learning that bridge roles and positions without dissolving them is a promising entry point to goal-oriented participation.

**Proposition 8-
Integration and
Collaboration**

Collaborative efforts of integration have necessarily to take into account the recursive nature of transdisciplinary research. Combining different means of integration, i.e., developing joint theoretical frameworks, applied models, and concrete common outputs – in an iterative or circular process – has proven to be particularly successful. At the same time, transdisciplinary work should be organized in a manner that enables a productive balance between structured collaboration and vested interests by participating partners and disciplines.

Appendix 1 continued...

Scope, Process and Outcomes of Transdisciplinary Research	
Proposition 9 - Values and Uncertainties	In order to give sufficient attention to values and stakes at all stages of transdisciplinary processes, collaborations and negotiations should be dominated by a mutual learning attitude, not by positions. This is best promoted by adequate time allocation, by creating broad ownership of the problems, and by building value-consciousness through reflexive processes among researchers. Reflexivity is also the core means for dealing with uncertainties and the outer boundaries of knowledge resulting from transdisciplinary endeavors.
Proposition 10 - Management and Leadership	The leading of transdisciplinary projects primarily implies finding a satisfactory balance between periods of intense collaboration with clearly defined joint outputs and periods where deepened disciplinary and multi-disciplinary contributions can be elaborated. This balance of periods is best supported by management services that simultaneously ease administrative tasks for participants, provide clearly structured and timed means of communication, integration and reflexivity, and support internal and external recognition of all contributors, i.e., through providing access to extended peers.
Proposition 11 - Education and Career Building	Transdisciplinary training and education is best developed in close connection with the disciplines of origin. Besides building communication and collaboration capacities through practical exposure, emphasis should be put on reflexivity and on methodological, conceptual, and theoretical skills that enable the exploration of boundaries and connections between disciplines. Related career building can be supported by careful planning and sequencing of outputs targeting the reference systems of the original discipline and the enhanced peers of transdisciplinarity.
Proposition 12- Evaluation and Quality Control	Evaluation of transdisciplinary research has to go beyond traditional reference systems. It should include qualifying integration and collaboration of disciplines and stakeholders, the recursive design of the research process, and the way the project is

Appendix 1 continued...

Scope, Process and Outcomes of Transdisciplinary Research	
	based on, and can provide input to scientific knowledge and societal problem handling. In order to strengthen internal quality control efforts, researchers should concentrate on finding the delicate balance between respecting specific competence and transgressing them in constructive and critical dialogue within transdisciplinary teams.
Cornerstones for Enhancing Transdisciplinary Research	
Proposition 13-Facing the Scientific Challenge	Good and concrete transdisciplinary practice must be supplemented by efforts at the levels of its scientific foundations and its scientific recognition. Such efforts must go beyond systematizing transdisciplinary research procedures and aim at theoretical, methodological, and topical development and innovation at the interface with participating disciplines – to the benefit of both sides. Facing these challenges requires development of extended peer networks and other collaborative networks that bridge transdisciplinary and disciplinary reference and quality control systems.
Proposition 14 - Facing the Institutional Challenge	To enhance transdisciplinary research, its scientific foundations and its innovative potential for participating disciplines as well as the institutional position in science and academia have to be strengthened. This means incorporating aspects of transdisciplinarity into research, curricula, and career building within established disciplinary institutions. It may also include promoting specialist transdisciplinary institutions. The growing network of peers will need to play a key role, allowing transdisciplinary practice to be promoted more proactively by the scientific community.
Proposition 15 - Facing the Societal Challenge	Efforts to enhance transdisciplinarity should be accompanied by and embedded into a societal debate on the role of science in society, particularly when dealing with factual uncertainties. At the same time, the scientific community is urged to constantly renew the debate on the role of values and stakes in research. Contributing to solving life-world problems through transdisciplinary research requires science to be conscious and explicit in terms of values and in terms of the boundaries of knowledge and findings – and it requires a corresponding image of science in society.