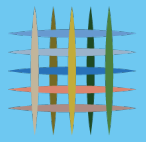
INATE by UNCECAR



INATE

INTERNATIONAL NETWORK FOR
ADVANCING TRANSDISCIPLINARY EDUCATION

INATE by UNCECAR

Background

The INATE concept evolved through the discussions at the 8^{th} International conference and strategic planning meeting of the University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR) held in Malacca, Malaysia from 30 May to 1 June, 2014 and the workshop on Transdisciplinary Education for Disaster Risk Reduction (TeDrr) organised at the United Nations University in October, 2014. The concept note prepared by UNU-IAS based on these discussions was reviewed, commented and approved by the UNCECAR members and associate universities. In addition individual UNCECAR advisors are gratefully acknowledged for their insightful comments.

UNCECAR members and associates

- Australian National University, Australia
- Queensland University of Technology, Australia
- Chinese Academy of Forestry, China
- Tsinghua University, China
- Indian Institute of Technology, Delhi, India
- Indian Institute of Technology, Kharagpur, India
- Indian Institute of Technology, Roorkee, India
- Gadjah Mada University, Indonesia
- Ibaraki University, Japan
- Kyoto University, Japan
- Ritsumeikan Asia Pacific University, Japan
- The University of Tokyo, Japan
- Universiti Kebangsaan Malaysia (UKM), Malaysia
- Tribhuvan University, Nepal
- University of Engineering and Technology Lahore (UET), Pakistan
- University of the Philippines, Philippines
- Nanyang Technological University, Singapore
- University of Peradeniya, Sri Lanka
- Pukyong National University (PKNU), South Korea
- Yeungnam University, South Korea
- Asian Institute of Technology, Thailand
- Chulalongkorn University, Thailand
- Viet Nam National University, Viet Nam
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WHY TRANSDISCIPLINARY EDUCATION?

The global challenges we are facing today - food security, massive poverty, malnutrition, disease and epidemics, climate change, civil wars and conflicts, natural and man-made disasters, among others - are threatening our very existence and our planet's sustainability. During the past few decades, we have seen great advances in science and technology that increased our understanding of the physical world immensely and an explosion in Information and Communications Technologies (ICTs) that brought world closer. Yet translation of these advances to progress in our ability to solve pressing societal problems is yet to be seen. Our experiences with defining and working for Millennium Development Goals (MDGs) are very instructive in this regard. The difficulties in achieving the MDGs were in part due to inadequacy of local capacities that resulted in a general lack of societal involvement in the conceptualization, development, implementation and maintenance of programs to achieve MDG targets. It has become clear that effective formulation and implementation of solutions that address global challenges need an approach that is locally grounded and involves the widest participation of stakeholders. We have achieved meaningful partnerships and collective engagement in the past as we shifted from monodisciplinary (isolated) approaches to multidisciplinary (additive) that brought together a wide range of expertise and then to interdisciplinary (interactive) approaches where the problems were solved together by experts. However, the highly uncertain, highly complex and fast-evolving problems we are currently dealing with require a more holistic transdisciplinary approach that brings together actors other than those in the academe and professions - local government units, NGOs and communities, among others - in order to enable rapid transfer of knowledge, experiences and quick feedback.

Within the academe, recognition of this problem has led to concerted effort to transcend traditional forms of knowledge production, which has usually been organized into academic disciplines and where the interest is primarily to produce knowledge on the physical and human components of nature. Under this tradition, universities have been organized in faculties and departments. Moreover, the reward system, career system and quality control by peer review are contained within disciplinary boundaries. With modern society's increasing demands for application-oriented and usable scientific knowledge, integration of knowledge from various disciplines has become necessary. But this shift from monodisciplinarity to multi- and interdisciplinarity, while a great step forward, has proven to be still insufficient in addressing these demands. There is an emerging agreement that addressing these complex, interwoven problems in a sustainable manner requires new, efficient ways of knowledge application. Consequently, a new mode of transdisciplinary, problem and solution-oriented education and research is emerging on top of traditional academic research, which seeks the involvement of a wider set of institutions and types of researchers to work on specific problems within specific contexts. Here, research is not exclusively based in universities but is conducted together with the implementing agencies, user communities and professional bodies.

This concept of transdisciplinarity was the inspiration behind the birth of Sustainability Science, proclaimed as a new academic field during the World Congress on Challenges of a Changing Earth 2001 in Amsterdam. Sustainability Science differs from standard science in that it seeks a complimentary truth to traditional form of knowledge generation. Sustainability Science asserts that the search for sustainable solutions to global problems require new methodologies that bring together the three pillars of sustainability: environment, society and economy. Sustainability Science is therefore envisioned to be a transformational scientific field with its transdisciplinary, community-based, interactive and participatory approaches to education and research.

At this present conjuncture, there are two major challenges (a) Designing educational and research programmes supporting transdisiciplinary approach to knowledge generation. (b) Developing methodologies for the design and implementation of transciplinary development projects, which also requires research.

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INTERNATIONAL NETWORK FOR ADVANCING TRANSDISCIPLINARY EDUCATION

The University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR) proposes to establish an **International Network for Advancing Transdisciplinary Education (INATE)** to promote transdisciplinary approach to knowledge generation and project implementation by inviting academia, professionals, local governments, private sector and communities to work together to share expertise and experiences. Only through such a network can we secure the best available knowledge, reconcile values and preferences and create ownership of problems as well as solution options, which are all seen as necessary both to solve our real-world problems and to meet our sustainable development objectives. INATE is envisioned to serve as a platform for joint knowledge creation and as an incubator for the translation and implementation of this knowledge to transdisciplinary practices in addressing global change challenges. INATE will conduct a series of research/demonstration projects on a few selected themes to achieve these objectives. Such projects can serve as a catalyst for the development new interdisciplinary courses and training programmes based on the needs arising from their implementation. In addition, these research/demonstration projects will also address some of the important elements of design and implementation of transdisciplinary projects such as;

- Identification of critical societal needs to be addressed within the scope of the project.
- Customising global knowledge to local conditions.
- Avoiding conflicts in a multi-disciplinary and multi-stakeholder setting.
- Encouraging active and continuous participation of stakeholders throughout the project duration.
- Maintaining sustainability of transdisciplinary projects
- Leadership and accountability for implementation of transdisciplinay projects.
- Disseminating and creating adequate awareness among decision takers and planners at local level.

At the end of these research/demonstration projects, it is expected that all stakeholders will have a clear understanding of the challenges, complexities of project implementation and each other's expectations from the outcomes. The research required for customizing available knowledge and methods to local conditions and confirmation of methodological approaches also can be carried out during this pilot project phase. At the end of the research/demonstration project, this common understanding and the outcomes can be upscaled into development projects by local or national governments.

Based on the experience of the UNCECAR it is envisaged that the **Postgraduate Sector** of a committed network of universities would be best suited to create platforms for multi-stakeholder participation for such pilot project design and implementation. UNCECAR was established as an outcome of the Conference on The Role of Higher Education in Adapting to Climate Change held on 10-12 June 2009 at the United Nations University (UNU) headquarters, Tokyo, Japan. It was conceived as a regional network that will provide educational and research programmes to produce the necessary students and educators as well as research programs that are needed for effective adaptation to climate and ecosystem changes. It has developed 6 postgraduate courses and two training programmes which are regularly offered through a network of universities and practitioners to different stakeholders in the region. The courses include building resilience to climate change, leadership for sustainability, renewable energy and training on climate projection downscaling and application in food and water sector.

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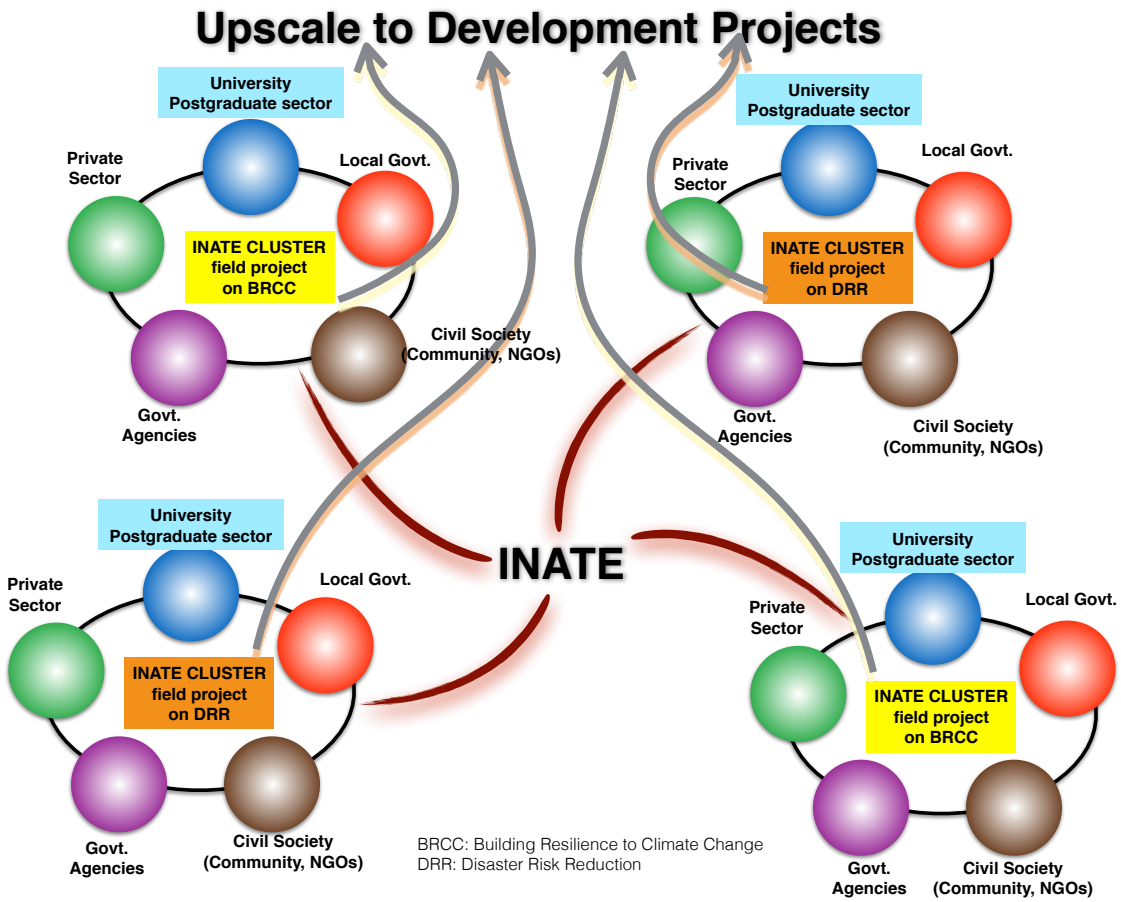
UNCECAR is well-versed with transdisciplinary principle and approaches since its research programs have been conducted as transdiciplinary pilot projects in collaboration with a number of local/regional stakeholders. These projects served as platforms to integrate education, research and capacity building to solve real world problems through an iterative process that encourages collective problem definition, coordinated research, development of flexible and sustainable solutions, and strong commitment to these solutions. The experiences and lessons of UNCECAR thus provide a starting point for INATE in developing its programme. As such it is proposed to expand UNCECAR framework to include multi-stakeholder clusters with universities playing a major role in coordinating and facilitating research/demonstration projects within INATE framework.



INATE concept

INATE FOCUS

Transdisciplinary Education for responding to evolving risks from rapid global change will be the initial focus of INATE. Disaster Risk Reduction and Building Resilience to Climate Change are the two core educational and research programmes of the INATE under this focus.

Building Resilience to Climate Change (BRCC)

The current and future impacts of climate change are considered among the most important issues faced by humanity. Countries, regions, economic sectors and social groups differ in their degree of vulnerability to the impacts of climate change. People in least developed and developing countries are among the most vulnerable yet have the least capacity to cope and adapt. Rapid and holistic actions based on mutual understanding and international cooperation are required to address the vulnerability of these groups. Such actions should focus on building the adaptive capacity and resilience of the most vulnerable, while mitigating the effects of climate change. This necessarily requires knowledge generation, capacity development and knowledge transfer on climate change and adaptation strategies.

Adaptation to climate change is very much a localized activity as the impacts of climate change vary from one area to another depending on local conditions. As such, adaptation strategies have to be developed locally, supported by global knowledge and experiences. For these strategies to evolve locally, local capacity development is essential, especially in the developing countries, to customize available global knowledge to local conditions. Climate change and adaptation is therefore one area where transdisciplinary approaches is most necessary.

Based on a number of studies on climate change and adaptation, some key areas emerge where additional research and/or and capacity development is needed. These include: (1) downscaling of climate change forecasts to local scale (GCM outputs); (2) assessment of climate change impacts on different sectors (impact models); (3) development of different response strategies; and (4) assessment of the appropriateness of these strategies by analyzing the consequences of their application. Many countries, especially developing countries, face difficulty in addressing these since most require the use of emerging knowledge and methodologies to which these countries have no access. Additionally, there are the problems of the lack of qualified professionals and faculties in the required fields, lack of dialog between researchers and the implementing communities and thereby absence of feedback loop, and inadequacy of the higher education sector to take on research programs that will allow customization of global knowledge and adjustment of future projections to local conditions.

INATE's transdisciplinary education and research programs on BRCC shall therefore be designed to address these problems. In particular, these programs should be based on the needs and current development stage of the target countries/communities. They should aim to increase the number of technically competent persons who can use advanced environmental observations and global climate/weather forecasts. Finally, they should facilitate the customization of knowledge to meet local conditions and constraints.

INATE FOCUS

Disaster Risk Reduction

Trends in natural disasters show that they are increasing steadily in most regions of the world. Rapid global changes are modifying the frequency as well as the magnitude of weather related extremes, rendering current safety measures and standards obsolete. At the same time, there is increasing concentration of population and assets in urban and vulnerable areas. These, coupled with globalizing processes that have made world population very much interdependent, are triggering unprecedented losses from natural disasters. We are therefore urged to look into these problems with a deeper perspective and search for new approaches that will more reliably bring about desired results.

During the past two decades, there has been a shift from a reactionary to proactive, preventive approach to address disasters, and the focus has changed from hazard mitigation to the more appropriate risk reduction. Also, as mentioned earlier, there has been a move from mono-disciplinary to multi-disciplinary and then to inter-disciplinary approaches to addressing issues and concerns, including disaster management. Today, as we increasingly recognize that disaster risks are primarily local in the sense that they are modulated by the local geo-biophysical and social conditions and their impacts are most felt at the local level, there is realization of the necessity to tailor mitigation and adaptation strategies to local needs and conditions. Moreover, given the complexity, future uncertainty and evolving nature of the problems we are facing, continuous monitoring and updating of strategies are necessary, which require rapid transfer of knowledge and experience and efficient feedback mechanism. All these are possible only through transdisciplinary approaches that engage and encourage the widest participation of all stakeholders especially those at the local levels.

In INATE's Transdisciplinary Education on Disaster Risk Reduction (TeDrr), the aim is to create DRR knowledge jointly through project-based DRR programs at the local level that shall involve a broad coalition of universities, local governments, NGOs and communities. These projects should focus not only on disaster risk reduction, but also how these measures are incorporated in to the improvement of daily lives. This shall serve as our commitment to the post-2015 framework for disaster risk reduction and shall be rooted in sustainability science supporting post 2015 Sustainable Development Goals. TeDrr is expected to strengthen the priority area *Knowledge and Education* of the Hyogo Framework of Actions and contribute to the World Conference on Disaster Risk Reduction to be held in 2015 in Sendai.

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INATE CALL

During the past few decades, we have seen great advances in science, technology, information and communications. Yet, real progress is still to be seen in our ability to solve pressing societal problems. The highly complex problems of today spawned by rapid global changes evolve too fast for us to adapt to such changes effectively. Their inter-connectedness requires a holistic transdisciplinary approach that brings all stakeholders together, including the academe, local government units, NGOs and communities, to foster rapid feed backs and effective exchange of knowledge and experiences that will enable efficient formulation of sustainable solutions. Transforming conventional project planning to transdisciplinary project design and implementation requires new research on collective solution identification, program design and implementation. This calls for a new type of education and training that promotes transdisciplinary actions. UNU-IAS's experience with a network of leading universities in the region, the University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR), demonstrated that postgraduate sector networks can develop and deliver effective educational and capacity development programs to promote such transdisciplinary approaches. This document proposes a framework for an international network to promote new approaches to integrate education, research and capacity building to solve real world problems through an iterative process that facilitate collective problem definition, flexible solution approaches and commitment to sustainable solutions.