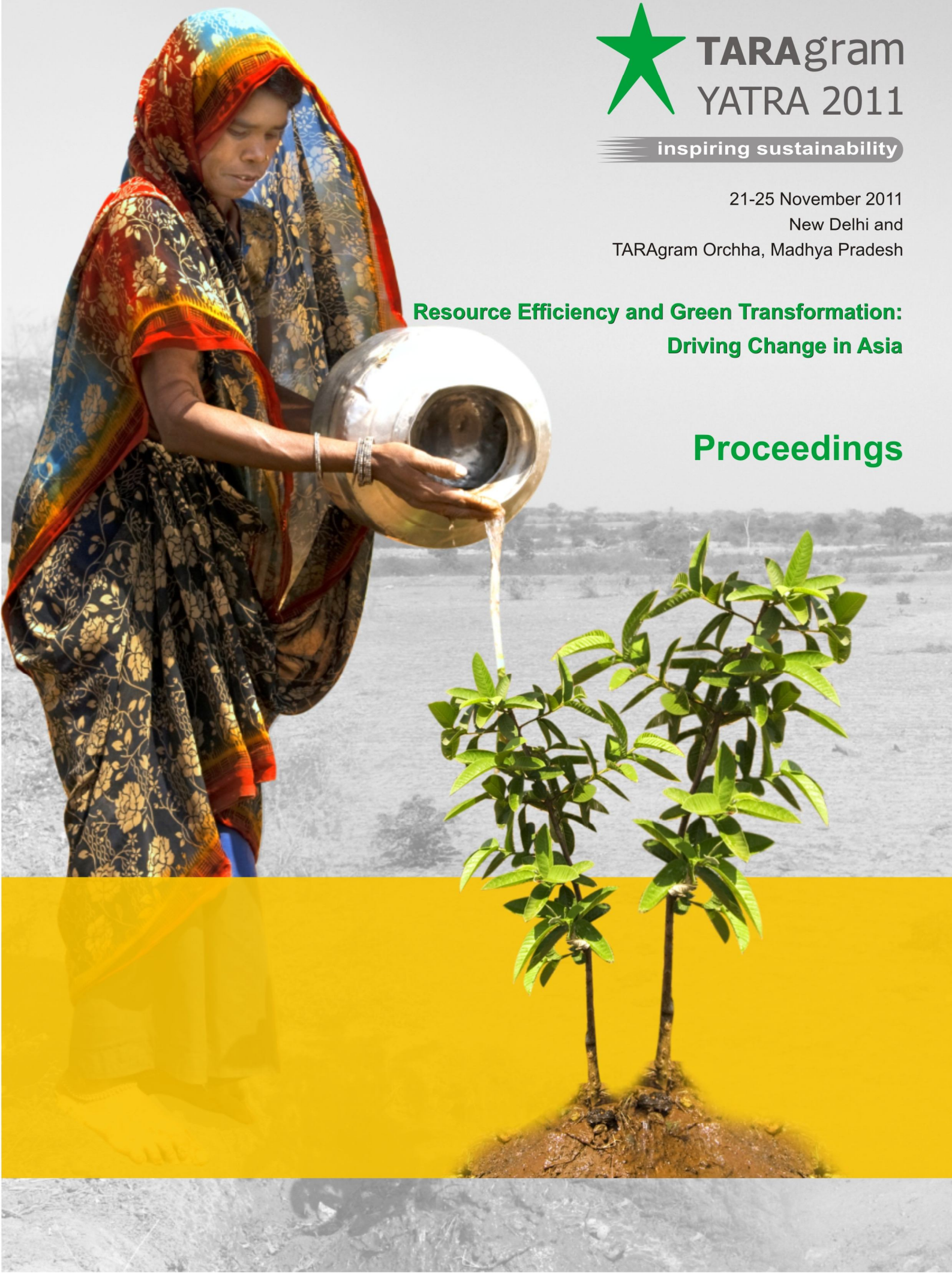


TARAgram YATRA 2011

inspiring sustainability

21-25 November 2011
New Delhi and
TARAgram Orchha, Madhya Pradesh

Resource Efficiency and Green Transformation: Driving Change in Asia

Proceedings

Content

Acknowledgment 03

Preface 04

1. Background 05

2. Holistic Approaches to Green Growth 07

- Crisis of the Three 'F's – Finance Food and Fuel 07
- Engineering Green Growth 07
- Green Economy Approach 09

3. Learning from the Context 10

- Decoupling for Developing Nations 10
- Bundelkhand: A Semi-arid Region in Central India 10
- Toward a Green Bundelkhand: Context-specific Solutions Implemented by the DA Group 11
- Water Management and Conservation 12
- Advanced Farming Techniques for Improved Productivity 12
- Livelihood Generation and Support Systems 13
- Scaling up: 12 Pathways to Green Growth 13

4. Green Growth and Measures for Scaling Up 17

I. Green Power for the People and by the People 17
II. Together for a Green South 18
III. Green Enterprises for Community Empowerment 19

5. Moving Forward 20

Annexure 21

- TARAgram Yatra 2011 – Agenda 22
- Profile of TARAgram Yatris 37
- Presentations 62
- Concept Paper

Acknowledgment

We extend our gratitude to all those who have contributed in TARAgram YATRA 2011 - the Yatris, the rural communities of Bundelkhand, all our delegates and speakers representing rural communities, civil society, policy makers from India and other countries, bi-lateral and multi-lateral organisations, and others.

The event would not have possible without the generous support from the United Nations Environment Programme's International Resource Panel and its Steering Committee, the Ministry of Environment and Forests, Government of India and Federation of Indian Mineral Industries (FIMI), and the Aditya Birla Group and its subsidiary, ESSEL Mining and Industries Limited. We express our sincere thanks to them for their kind support and cooperation.

We also wish to congratulate the entire DA Group for their wonderful effort. Special mention must be made of the team which designed the TARAgram Yatra 2011, our colleagues in Bundelkhand Resource Centres and the logistics and the event management team. We thank all of them for their crucial support without which the Yatra would not have been successful.

We think that this event was able to motivate various stakeholders on the need for green transformation leading to a green economy. The policy suggestions and decisions that were made in the course of this event, we hope, will be taken forward for effective dissemination and greater implementation.

The Development Alternatives Group

Preface

TARAgram Yatra 2011 was conducted by **Development Alternatives (DA)** in association with the **United Nations Environment Programme – International Resource Panel,** under the theme of **Resource Efficiency and Green Transformation: Driving Change in Asia**. The event's activities facilitated networking between UNEP panelists, the DA team, development experts and representatives of partner organisations from around the world. The Yatra likewise exposed participants to the DA Group's sustainable resource management approaches and on-the-ground practices in green development, enabled deliberation on the subject of sustainable growth, and provided a foundation for key policy shifts in the areas of green job creation, conservation and resource management.

Capacity Building

Field visits to seven Bundelkhand villages immersed capacity building workshop participants in the practical, hands-on efforts of the **DA Group** to effect the transformative sustainable development of the rural areas of **Bundelkhand** and to empower its communities.

TARAgram Yatra 2011 - Participants

The **Yatra**'s international body of participants was convened to share cutting-edge ideas on building economies that do not jeopardise the future of our environment.

Participants represented the following international development organisations:

- Clean Energy Nepal
- Energy Forum (Sri Lanka)
- Forum for Sustainable Development (Nepal)
- Grameen Bangla - Unnayan Onnashan (Bangladesh)
- Green Energy Initiative (India)
- Infrastructure Development Corporation Lmt - IL&FS (India)
- National Bank for Agriculture and Rural Development (India)
- Sri Lankan Youth Climate Action Network
- State Water Resources Agency (India)
- SV Network (Vietnam)
- Tarayana Foundation (Bhutan)
- United Nations International Resource Panel (IRP) (Africa, Asia, Europe, South America)
- Vikas Sahyog Kendra (India)
- World Vision (Vietnam)

Outcome

The **TARAgram Yatra 2011** has catalysed fruitful interactions among representatives of key organisations whose primary aim is to address our multifaceted global crisis with recourse to polyvalent strategic solutions that mobilise key stakeholders and pool best practices. The event's activities facilitated networking between UNEP panelists, the Development Alternatives team, development experts and representatives of partner organisations from around the world. The Yatra likewise exposed participants to DA's sustainable resource management approaches and on-the-ground practices in green development.

1. Background

As economic growth precipitates the intensified consumption of renewable and non-renewable resources, policy makers attempt to address the pressing issue of resource scarcity. Existing policies and initiatives, however, do not always interlock with the greatest possible degree of efficiency and coherence. The task for the **9th Meeting of the UNEP International Resource Panel (IRP)** that took place in November 2011 in New Delhi was, therefore, to evolve a holistic methodology for resource management and systematise the mobilisation of existing and prospective measures for green transformation.

TARAgram Yatra 2011 was planned as a practice to policy event with field visits associated with the **9th Meeting of the UNEP International Resource Panel (IRP)**, with the intention of facilitating networking between UNEP panellists, the Development Alternatives team and development practitioners from partner organisations. The Yatra was likewise designed to expose participants to DA's sustainable resource management approaches and on-the-ground practices in green development. One of the central goals of **TARAgram Yatra (TGY) 2011** has been to support the practice-policy links by showcasing current best practices in sustainable development and permitting interaction between grassroots community members and visiting international experts. This approach to Capacity Building integrated theory, deliberation, and practice: presentations by participants, deliberation sessions, and field interactions took place at TARAgram sustainability resource centres managed by Development Alternatives in **Bundelkhand, Central India** for rural livelihoods. Bundelkhand is a drought-prone region where efforts to promote resource efficiency are motivated by pressing resource scarcity.

Yatris interacting with Women Self-help Group

The Yatra brought together civil society organisation representatives from South and South East Asia, development practitioners, policy makers, researchers, as well as members of the **UNEP International Resource Panel and its Steering Committee**. Participants attended a capacity building workshop that ran from the 21st to the 25th of November 2011, and consisted of an exposition of sustainable practice models and guided field visits interlinked with discussions and group work on planning scalable sustainability initiatives.

This Capacity Building Workshop was informed by issues being discussed by UNEP – IRP. The **International Resource Panel's** first meeting in Asia was unquestionably timely: issues of resource management are particularly germane in rapidly developing **Asian economies**, where concerns of poverty and inequitable resource distribution, as well as those of significant climate change vulnerability, align with opportunities for laying genuinely green economic, infrastructural, and policy foundations to ensure sustainable and ecologically balanced development.

TARAgram Yatra 2011 was conducted by **Development Alternatives (DA)** in association with the **UNEP IRP,** under the theme of **Resource Efficiency and Green Transformation: Driving Change in Asia**. The event's activities facilitated networking between UNEP panellists, the Development Alternatives team, development experts and representatives of partner organisations from around the world. For nearly 30 years, the DA Group has pursued the mission of creating large-scale sustainable livelihoods and of designing, developing and implementing resource-efficient technologies, resource

management systems and institutional models. The **TARAgram Mela** (fair) was an interactive exhibit of these practices and technologies in eco-responsible agriculture, resource-efficient construction, renewable energy systems and social enterprise models including training groups and cooperatives, women's empowerment associations, community radio programming and an award-winning rural reality show.

TARAgram Mela - Renewable Energy Stall

Field visits to seven Bundelkhand villages immersed capacity building workshop participants in the practical, hands-on efforts of the DA Group to effect the transformative sustainable development of the rural areas of Bundelkhand and to empower its communities. Expert guides were available to offer detailed descriptions of on-the-ground projects and initiatives answer visitor's questions and facilitate international visitors' interactions with members of the village communities. The alternation of field visits, moderated discussions and presentations by international experts and practitioners permitted the immediate sharing of salient experiences and facilitated the conceptualisation of approaches to resource-efficient economic growth with a special emphasis on circumstances facing developing nations. Group consultations resulted in the production of three concept notes outlining the way forward in future international efforts on streamlining resource use, sharing scalable technologies, implementing ecologically responsible habitat construction and addressing poverty and deprivation in developing regions.

The **TARAgram Yatra 2011** has become a benchmark in capacity building, and a landmark event catalysing interactions between international development professionals and the inhabitants of Bundelkhand, including women from a traditionally conservative background, whose community efforts are making sustainable growth a reality in a region known for its lack of access to livelihood opportunities, adequate water supply and reliable energy sources. The **TARAgram Mela,** a first-time exposition of the outcomes of DA's long-time cooperation with the people of rural Bundelkhand, enjoyed such marked success that it will now become an annual event strengthened by the participation of partner organisations of the DA Group, with plans to turn select DA exhibits into permanent installations.

Participating rural inhabitants of Bundelkhand and the Development Alternatives Group were fortunate to have had the opportunity to showcase not only the technical and economic but social aspects of sustainable development, especially concerning work in the area of women's rights, entitlements and empowerment. The **TARAgram Yatra** could not have come at a more strategic moment: on the national level, the Government of India is becoming increasingly cognizant of the social and environmental difficulties facing Bundelkhand, and making enormous investments in the construction of roads, creation of energy supply systems, and other development projects. From an international perspective, while being appended to the **9th Meeting of the UNEP IRP,** the **TARAgram Yatra** was also conducted on the eve of the **COP17 meeting in Durban**, where representatives of developing nations challenged the world to address rising concerns regarding climate change climate change adaptation and green growth. The DA Group is optimistic that the international ties and strategies for future action established during this unique event will set new parameters for streamlining truly cooperative and international sustainable development efforts.

2. Holistic Approaches to Green Growth

Crisis of the Three 'F's – Finance Food and Fuel

Globally, a crisis implicating the financial sector as well as fuel and food sources propels a poverty-driven cycle of unemployment, lack of ecologically responsible markets, resource depletion and continued income loss. Economic growth experienced over the past five decades has been accompanied by two major problems: inequitable and unsustainable use of resources coupled with ecological damage. Although the global GDP has more than doubled between 1981 and 2005, poverty and distress migration are on the rise, and 60% of the world's ecosystems have been degraded.

Growing food and fuel prices are having a particularly damaging impact on developing nations: those populations facing the greatest degree of urgency for economic, technological and infrastructural investment are being forced to expend ever greater shares of their resources on energy and sustenance. The increasing frequency of natural disasters, droughts and altered weather patterns attributed to climate change are precipitating human tragedies as well as financial losses measured in trillions of dollars. The loss of biodiversity is having an irrevocable impact on natural systems and leaving a heritage of ecological impoverishment for future generations. Solutions to these multidimensional problems must of necessity be holistic, so as to bring about balanced, enduring progress toward ecologically sustainable existence, particularly for vulnerable communities.

A sustainable development paradigm cannot proceed along the lines of conducting business as usual. Hence, world leaders, economists and development practitioners have set out to delineate the parameters of a new framework for economic growth decoupled from ecological degradation. The **TARAgram Yatra** takes as its point of departure the definition of a Green Economy as a system that creates sustainable livelihoods by reducing our carbon footprint, strengthening social capital while generating green products and services and lifting millions out of poverty while simultaneously restoring the environment.

Solar panels at TARAgram Pahuj

Engineering Green Growth

The engines of green growth are investment in ecologically responsible sectors, environmental accounting, and the introduction of environmentally friendly and equitable business models and policy reform. Circular systems are an essential component of the green approach to economic development: these ensure a powerful closed-loop approach whereby the waste of one mode of production becomes a resource for the emergence of new products. Another indispensable aspect of green growth is ecological sensitivity stemming from recognition of the fact that the world economy is

subject to ecological principles and limitations, and rests upon nature and its resources as an ultimate basis.

The UNDP initiative for the economic valuation of biodiversity is a substantial step forward in this regard. Consideration of biodiversity, nature's carrying capacity, resource scarcity and the pollution of essential resources such as water and soil are paramount in the setting and execution of green development goals. When it comes to engineering economically and ecologically sustainable innovations, special attention must be paid to benefits accruing to those who implement the innovative practices. When there are uninterrupted cash flows along a value chain, sustainability results. However, the interruption of cash flows in terms of livelihood generation has a negative impact on interest levels, resulting in process ruptures that cause people to return to unsustainable practices.

Green Economy Approach

The Green Economy Approach privileges a systems-based methodology whose main building blocks are low carbon-infrastructure, manufacturing, transport and reduced consumption, sustainable food production as well as waste water, sanitation and management in solid waste-systems, green jobs, sustainable livelihoods for the poor and a sustainable lifestyle for all, all achieved through a rigorous mindset change. A central component of 'green' growth for the Green Economy Approach is the equitable distribution of resources and benefits accruing as a result of economic development achieved through empowerment of the underprivileged through means including participatory governance.

TARAgram Yatra 2011 - Group Sessions

Movement toward the **Green Economy** requires an approach simultaneously engaging social, economic, ecological and technological facets of human activity towards greening complete economy value chains. Fruitful interactions among representatives of key organisations whose primary aim is to address our multifaceted global crisis with recourse to polyvalent strategic solutions, which mobilise key stakeholders and pool best practices that enhance the TARAgram Yatra are required. In order to support the evolution of sustained green value chains, a facilitating policy environment is essential, wherein interlocking aspects of domestic and international-level policy architecture eliminate perverse domestic subsidies. This while instituting appropriate taxes and incentives and introducing monitoring and accountability for environmental impacts, in all aspects of resource use from land use and urban development and the integrated management of resource supplies.

On the international level, we must enable technology transfer and support of global markets for ecosystems services, especially freshwater management and marine resources as well as the coordination of international trade and aid with carbon market flows. The evolution of a supportive policy environment requires adequate knowledge support. To this end, research organisations such as the **Climate and Development Knowledge Network** seek to connect the knowledge gaps of policy makers with expert research services and custom-designed research tools. In addition, they look to building networks between climate change, sustainable development and community empowerment groups and facilitating partnerships between government bodies, civil society organisations and the private sector.

A holistic strategy for enabling the emergence of the Green Economy must embrace plural areas of focus including those on water and sanitation, renewable energy and air quality. Such a strategy must also be capable of uniting polyvalent modes of activity, namely, enterprise development, awareness and capacity building with an emphasis on empowering youth to contribute to the health of their communities through technical training, research revealing specific needs for government investment in infrastructure, followed by suitable policy development and implementation as well as policy advocacy and engagement with government officials.

On the level of enterprise development, great potential lies in the waste-to-wealth synthesis of eco-cleanup, technological innovation and income generation. For instance, fly ash brick making has been one among a range of promising technologies demonstrated during the TARAgram Yatra. This technique turns harmful industrial waste into quality building products and dignified jobs for marginalised members of our society. Likewise, the recycled materials papermaking unit at TARAgram Orchha, turns textile industry waste into high-grade wood-free paper. Such promising entrepreneurial ventures have the best chance of success when they are blended with emerging social innovations: women's self help groups offering microfinance services and peer support, farmers' clubs sharing experiences in resource management and efficient farming techniques, masons' groups facilitating capacity building and enterprise creation in eco-construction – all these manifestations of social capital are key to stimulating and maintaining the momentum of innovative solutions for meaningful change in Asia.

3. Learning from the Context

Decoupling for Developing Nations

As the world's population is expected to reach nine billion by 2050, intensive efforts toward decoupling economic activity from unsustainable resource use will be required to prevent global economic and ecological collapse. In the context of the developing world, the Sustainable Development and Human Settlements Division of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) recommends the pursuit of "non-material" economic growth as the means of continuing improvements in living standards while at the same time preventing ecological degradation and resource depletion (UNEP, 2011, p.4). Two types of decoupling are needed to ensure the necessary results: *resource decoupling* denotes the reduction of material and energy expenditures in producing a given unit of economic output; *impact decoupling*, on the other hand, refers to the reduction of ecological ramifications resulting from economic activities (UNEP 2011 5). Resource procurement, resource consumption and the resulting ecological impact are intimately linked, especially under present-day economic practices.

Movement toward non-material economic growth will necessitate answering context-specific questions about the most expedient avenues for improving resource efficiency in the process of meeting basic needs. How can the scarcest non-renewable resources be used with the greatest degree of efficiency while ensuring equitable access by all those in need? Which materials are least ecologically costly to procure and transport? Where can circular links be established for the use of waste materials in the production of goods and energy?[1] Other central and equally context-specific questions to be answered by nations of the developing world will, therefore, centre on building social and cultural capital not only to facilitate the provision of basic needs, but also to provide individuals with the means of empowerment through support networks and increase the overall sense of human satisfaction through cultural cohesion and belonging.

Bundelkhand: A Semi-arid Region in Central India

Exposing participants to a particular Asian milieu through organised visits to developing rural settlements of Bundelkhand in Central India during the TARAgram Yatra has provoked practice-oriented thinking about context-specific drivers of eco-friendly development.

The Bundelkhand region covers an area of over 7.08 million hectares (Mha) in the states of Uttar Pradesh and Madhya Pradesh, and is characterised by hard, rocky and undulating terrain of varied slope, shallow and light-textured soils with degraded forests and rapidly reducing surface water bodies.

Sprinkler Irrigation System at work

[1] Notably, in reporting for ECLAC, Gallopin underscores the fact that "[w]hile demographic growth and material economic growth must eventually stabilize, cultural, psychological, and spiritual growth is not constrained by physical limits" (UNEP, 2011, p.34).

Referred to as the heartland of the nation, the Bundelkhand Region of Central India has a population of approximately 18.3 million, 77.5% of which is rural. The economy of here is predominantly agrarian; over 80% of the population is dependent on agriculture, livestock, usufructs from the forest and outsourcing income obtained by seasonal migration after the Rabi (winter) sowing. Crop production, livestock rearing and seasonal outmigration provide more than 90% of rural income in the Bundelkhand region. Agriculture production consists of more than 56% of cereals, 32% of pulses, 8% of oil seeds and 4% other crops.

The Bundelkhand region of both states faces difficulties related to the use of dated agro-technologies, a lack of infrastructure such as reliable irrigation, sanitation, communication and energy supply systems. In addition, a shortage of investment, inputs and marketing exacerbates the difficulties facing the people of Bundelkhand. The Bundelkhand region is one of the most underdeveloped regions of the country with very poor human development indices. Here, the literacy rate remains as low as 59.8 % and female literacy rates fall below the regional average (39.2 %). All the Bundelkhand districts of Uttar Pradesh with the exception Jhansi and four of six Bundelkhand districts of Madhya Pradesh are covered under the **Backward Region Grant Fund (BRGF)** scheme clearly indicating the region's requirement for special assistance for development.[2] With poor industrial development and inadequate energy and connectivity infrastructure the region does not have either sufficient livelihood diversification or options for the same, and affords limited employment opportunities. Water stress and insufficient agriculture/ livestock incomes regularly result in stress-induced out-migration, which increased from 15-20% to 40% in the drought period of 2003-2009.

Toward a Green Bundelkhand: Context-specific Solutions Implemented by the DA Group

In response to the difficulties facing the Bundeli people and ecosystems, the Development Alternatives Group has been pursuing an intensive sustainable development and community empowerment agenda in the region since 1983. Foremost, DA promotes the earning of sustainable livelihoods through the adoption of green and appropriate technologies at the grassroots level, privileging participatory approaches to the selection and implementation of ecologically responsible mechanisms and delivery models. In Bundelkhand, the core infrastructural base of the DA Group includes three sustainability resource centres: two located in the Tikamgarh and Datia districts of Madhya Pradesh, demonstrating green technologies and efficient irrigation systems, respectively. A third centre, located in the Jhansi district of Uttar Pradesh, is dedicated to the exhibition of energy-efficient irrigation systems and green farming technologies. Agriculture in Bundelkhand is vastly rain-dependent, diverse, complex, under-invested, risky and vulnerable. In addition, extreme weather conditions, like droughts, short-term rain and flooding in fields add to the uncertainties and seasonal migrations. The poverty situation in the region has also become extremely critical due to lack of employment opportunities. Added to this is the literacy-rate, which is crucial to development and empowerment and it remains as low as 55.73 per cent. With the female literacy rate below the regional average at 40.99 per cent, this region becomes the appropriate venue for DA for capacity building in growth.

[2] The Backward Regions Grant Fund is designed to redress regional imbalances in development.

Water Management and Conservation

Given the Bundelkhand region's reliance on agriculture as a predominant means of income generation, the first step toward enabling the region's self-sufficiency, therefore, lies in addressing water scarcity. Community support through watershed planning and documentation is an integral part of DA activities in Bundelkhand. Scientific planning in the management of natural resources becomes critical for sustainable development in the semi-arid context. Geo-information technologies yielding high-resolution satellite data are now used for geo-spatial macro-analysis and the provision of strategic decision-making support, since the approach to each watershed planning process must take into consideration its unique structure and requirements.

Water harvesting and conservation are pursued through reviving some traditional methods such as the construction of contour bunds, trenches, check dams and gully plugs that ensure the availability of water for agricultural purposes. Further, communities are supported in the efficient use of the available water through improved agricultural techniques such as sprinkler irrigation and drip irrigation that delivers water directly to the roots of seedlings and plants. Typically, one small check dam leads to a dramatic enhancement of a community's agricultural potential by enabling the harvesting of at least three assured crops, as also recharging wells for domestic use and making available drinking water for the large livestock population.

Check dam at Dhikoli

The innovation of water filtration purification and disinfection systems, as well as the provision of water quality testing devices has been a set of crucial steps in terms of basic needs fulfilment and disease prevention. DA works closely with local institutions, including Panchayats-elected local government bodies, through a participatory approach to ensuring communal ownership of and communal responsibility for water resources.

Advanced Farming Techniques for Improved Productivity

A sustainable and environmentally friendly approach to farming depends on capitalising on the strength of local institutions and traditional agricultural practices. When depleted soil can no longer give adequate harvest yields, impoverished farmers do not have the financial means to obtain supplementary food sources; further, they are not in a position to purchase the costly chemical fertilisers and pest control agents that are habitually used in commercial, large-scale farming. Here, DA seeks an alignment between financial common sense and ecological sustainability by offering green and easily available solutions for soil enrichment. Vermi-composting and the use of a local legume called *sesbania bispinosa* or **dhaincha** as a green manure raise the nutrient value of the soil, while new crop alternation systems and planting techniques minimise the negative effects of inter-species competition, crop disease and pest attacks. Uniform planting, the placement of seeds at recommended depth and intervals, as well as monitoring seed quality, drought resistant seeds, crop diversification and better producer-to-market links are all part of improving agricultural output with minimal expenditures.

Livelihood Generation and Support Systems

The Development Alternatives Group seeks to enable the self-sufficiency of the Bundeli people through capacity building and support of institutional networks for the empowerment of the marginalised. The involvement of all local stakeholders is sought in building community support networks for burgeoning small and medium enterprises. The stakeholder groups on DA's network roster include women's self help groups, farmer federations, local government bodies such as the Panchayati Raj institutions, financial service providers, including the National Bank for Agriculture and Rural Development, as well as research and academic establishments such as the Indian Grassland and Fodder Research Institute. Household and village-level enterprise networks connect small producers with markets: spice grinding and packaging, processing of agricultural products, poultry raising domestic cattle management, medicinal plant cultivation, vermi-composting and milk collection—these self-sustaining livelihood initiatives succeed owing to the setup of service and delivery points, the generation of demand and the building of capacities for answering local needs. Close to 1,000 community institutions brought together with the support of the DA Group currently manage finances to the sum of 10,000,000 INR (USD 230,000). Engagement with local decision makers have led to support with government schemes and subsidies.

Scaling up: 12 Pathways to Green Growth

I. Agro-forestry

Topsoil erosion can be addressed through a sustainable agricultural and land management approach: agro-forestry is one promising involves the deliberate integration of woody perennials, crops, and at times also animals within the same land management unit. Planting trees and shrubs in agricultural fields reduces soil erosion, increases the soil's moisture content and enhances regional biodiversity by incorporating several plant species within a given land area, thus creating a complex habitat capable of supporting a wide variety of birds, insects and other animals. Enhancing agricultural productivity and contributing to food security and additional incomes from the sale of fruits, nuts and edible oils, agro-forestry is also a tool for climate change mitigation due to the capacity trees and shrubs for carbon storage and the reduction of deforestation pressure on woodlands through the provision of fuel wood grown on farms.

II. Efficient Irrigation

Different models of Irrigation

Efficient micro-irrigation systems include drip and sprinkler methods, which are engineered to apply water to crops without exceeding quantities required for successful cultivation. Micro-irrigation enhances agricultural efficiency and productivity in addition to reducing the growth of weeds and enabling substantial savings in water use. The sprinkler irrigation method distributes water over crop areas like a natural rainfall through perforations or nozzles connected to pumps of suitable capacity. The careful selection of nozzle sizes, operating pressure and spacing ensure uniform application suited to the infiltration rate of the soil. With drip irrigation, water is carried to plants under low pressure through small-diameter plastic pipes and delivered at the root zone through drippers, leading to remarkable increases in productivity while simultaneously reducing the volume of expended water.

III. Renewable Energy

Vermi-compost facility at Gaushala

Renewable Energy is energy generated from any theoretically non extinguishable resource such as biomass, biogas, sunlight and wind. Decentralised renewable energy is a truly sustainable option with potential to empower millions and lead to the creation of green jobs. The power of the sun is being used to meet basic needs such as lighting, heating and cooking with solar powered lanterns, water heaters, and cookstoves gaining popularity among Base of Pyramid populations in developing countries. A community-managed solar power plant as piloted in the village of Rampura, in the state of Uttar Pradesh, India is a cost-effective and socially equitable answer to the energy needs of off-grid settlements. Biogas is another source of energy derived through the anaerobic digestion of manure in small scale digestion facilities that is thriving in South Asia. In recent years it is also gaining popularity in developed nations with a wide variety of feedstocks being tested for domestic use as well as transport.

IV. Green Construction Materials

Green construction uses efficient technologies and practices to ensure resource efficiency and reduced carbon footprints. The use of green building materials and promotion of green construction can provide dignified employment to those involved in their manufacture and contribute to green growth. There are a range of resource efficient technologies and practices available globally. What is required is increased technology transfer – both south - south and north - south combined with a favourable policy regime to increase demand and supply of green construction. A successful example is the adaptation of the Vertical Shaft Brick Kiln (VSBK), originally a Chinese technology, to suit Indian conditions. The VSBK is upto 40% more efficient than the traditional Fixed Chimney Kiln and through the involvement of a diverse range of stakeholders has been successfully transferred to several more countries including Vietnam, South Africa and Bangladesh.

V. Waste to Wealth: Approaching Closed-loop Production Systems

An important step to achieve optimal resource efficiency is ensuring that the life cycle of products and materials runs an optimum course. To conserve virgin resources, it is essential that processes of recovery and recycling be prioritized. This can be done in the case of several materials including metals, solid waste, construction materials and industrials waste among others. A good example is Fly Ash Bricks that are produced from the waste ash generated by thermal power plants and made into a good quality and cost effective building material.

VI. Green Enterprise: Women Producers of Biogas

Sustainable livelihoods can help economically disadvantaged members of society meet their daily subsistence needs in a manner that is dignified, locally appropriate, and environmentally sustainable. The *Gaushala,* an old-age home for cows in Village Madore, Madhya Pradesh, India started with just 20 acres of barren land and 20 non-productive cows given by the government to a group of tribal women who were landless. Today, it is a well-established, community-owned, biogas-based enterprise managed by women. Here, cow dung is used to produce biogas employed in generating electricity as well as powering irrigation pumps and groundnut decorticators, wheat flour grinders, spice grinders and oil expellers. Owing to the biogas, self-help groups comprising more than 300 village women are earning additional income through the production of pulses and nuts, groundnut shelling, pressing mustard seeds for oil and spice grinding.

VII. Pro-planet, Pro-women

Empowering women with skills and literacy fortifies their role as custodians of the environment, enables their access to new livelihood opportunities and improves their status both within the home and within their communities while decreasing population growth by giving women the capacity to take part in family decision making. DA's revolutionary TARA Akshar+ is a breakthrough computer-based literacy training programme that can teach an adult native speaker of Hindi reading, writing and basic arithmetic in just 49 days. Since its commencement, the Development Alternatives TARA Akshar programme has brought literacy to 60,000 rural women in four years. The software application uses a unique visual memory technique that links every letter of the Hindi alphabet to an object that the female students use in their daily lives. This memory association helps rural women to learn the alphabet quickly without forgetting what they have learned later on.

VIII. Planning for Green Growth: Geographic Information Systems (GIS)

New planning tools and information systems are needed for pro-planet decisions and policies to effectively curtail the environmental and ecological degradation of the planet. Remote sensing technology and Geographic Information Systems (GIS) are valuable tools for gathering and analysing environmental information. By using web-based interfaces, internet GIS systems remove technical barriers preventing unsophisticated users from accessing geo-spatial and statistical data. DA's interactive State of the Environment (SoE) Atlas – India is a spatial representation of how people interface with the nation's natural resource base that operates through a multi-dimensional portrayal of geographical information in the form of interactive maps, data tables, images and bibliographic materials capable of being shared easily and quickly among users

TARAgram Mela - Skill & Enterprise Development for Women

and stakeholders. Such GIS tools support discussion forums and provide systems for future knowledge capture and concerted decision-making.

IX. Communication Tools

Generating awareness and disseminating information on environmental degradation, climate change impacts and best practices are crucial steps for behavioural change and the first milestone in creating environmentally conscious citizens. Radio Bundelkhand is an ICT-based community radio initiative started by DA and jointly managed by the local community and DA. It acts as a sustainable and interactive platform for dialogue for the poor and the illiterate. Community radio is not only a source of information and entertainment for the rural women of the region, but also a tool enabling access to entitlements, coping tools and support networks for empowerment, as well as being an outlet for sharing stories, experiences, problems and even recipes.

X. Green Lifestyles

Consciously choosing environmentally friendly products and making decisions to reduce pollutants and waste can stimulate the green economy by increasing demand for green products and services as well as significantly reducing our carbon footprint. The TARA mini paper recycling plant has been especially designed to create widespread awareness of how each individual can help save our environment. Green technology designed to convert recycled waste into paper creates aesthetically pleasing products while consuming waste. It is a complete - yet uncomplicated - technology package with which even a child can turn waste paper and cotton rags into useful and valuable products. At the same time, it reduces pollution.

XI. Youth-driven Initiatives

Youth-driven initiatives are key to precipitating community eco-action, as the young play a pivotal role in influencing their families and communities to move on resource-efficient pathways. CLEAN-India (Community Led Environment Action Network), a student-led environmental programme, is a growing association of a million students, 800 teachers and more than 30 NGOs mobilising community responsibility for environmental improvement and low carbon lifestyles in 78 cities of India. CLEAN-India is anchored by a strong network of schools spread across 28 centres throughout the nation. The programme is nurtured primarily by local schools and environmental, residential and industrial welfare organisations. The CLEAN-India brigade seeks to restore the environmental health of every town, city and metropolis of the country. Such a cooperative effort considerably reduces the burden of and adds value to welfare measures adopted by the government.

XII. Self-Governance and Collective Action

Institutional arrangements for collective action from empowered groups are useful in deciding locally what works best for people and the planet. Through self help and common interest groups, people take charge of their own lives and access valuable support networks. Collective environmental action by empowered groups can increase cooperation, build resilience to climate change impacts and enhance capacities for localised action and governance. The TARA Karigar Mandal is a growing association of artisans skilled in state-of-the-art eco-friendly construction technologies. Their Unique Selling Point is ‘construction in harmony with nature’ and they educate the customer in the ecological value of the new construction technologies while also indicating the cost saving potential of making green choices.

4. Green Growth and Measures for Scaling Up

During the TARAgram Yatra some participants showed keen interest in renewable energy, and the practices followed by Development Alternatives to promote the same. However it was strongly felt that there is a need to scale up and promote financially viable renewable energy models. The participants had different aspirations such as use of better waste management systems in rural populations, provision of energy security for the bottom of the pyramid population through green energy and ensuring community participation, providing decision support tools for scale up of renewable energy and supplying a complete energy solution to the community for household electricity amongst others. These ideas were fused together and lead to the group deciding that their vision would be to develop systems for scalable, green energy security models for South/South East Asia.

I. Green Power for the People and by the People

Statement

The Green Power project aims to develop systems for scalable green energy security models for South and South East Asia.

Target Impact

The efforts will involve at least a million people in South and South East Asia through a minimum of 100 interventions.

TARAgram Mela - Sustainable Model of Water Mangement

Problem Analysis

Alternative energy technologies and mechanisms are available; however, these have not yet been mainstreamed due to implementation and scalability barriers. Consequently, poverty and lack of access to energy remain as serious problems while renewable energy technologies and resources are underutilised. Local value addition potentials have not been fully exploited. A large-scale demonstration of renewable energy technologies is required in conjunction with optimum resource management and poverty alleviation.

Planned Outcomes

The project will develop an engine for the viral replication of clean energy interventions for energy security at household and community levels, as well as evolving a self-sustaining model for the proliferation of clean energy across communities. Essential support will be provided to community and household-led interventions focused on enterprise development through the establishment of institutional linkages, critical partnerships as well as process and system toolkits.

Approach

The aforementioned outcomes will be achieved through policy influence and the involvement of local government bodies, banks and financial institutions, technology suppliers as well as organs of

verification and accreditation. Service providers, manufacturers and installers will forge partnerships critical for delivery and maintenance, working with community-based organisations and institutions.

Resource and landscape assessment and planning at household and community levels will take place for the protection of biodiversity and local supply management. Existing supply chains will be put into action for service delivery and maintenance, and decision support tools will be used for streamlining delivery and enabling training, capacity building, monitoring and evaluation. Local banks will be mobilised alongside microfinance institutions to provide support for starting entrepreneurs, and subsidies and carbon credits will be leveraged through policy influence. Awareness building and dissemination of knowledge materials will play a central role in securing citizen participation.

Outputs

The project will shortlist approximately **five models** and conceptualise pilot programmes for their implementation. Further, policy inputs will be provided to local and national governments. Stakeholder engagement and buy in will be achieved through critical partnerships with community-based organisations, civil society organisations, suppliers and organisation and management agencies. Blueprints for replication will be prepared.

II. Together for a Green South

Statement

A South-South exchange of best practices in resource-efficient technologies will be aimed at improving living conditions for the poor and marginalised.

Problem Analysis

Despite growing resource scarcity, existing resource-efficient technologies are not being implemented on the large scale due to lack of access to knowledge, lack of an enabling policy framework, lack of connections between available technologies and large-scale implementation.

Planned Outcomes

The project will result in increased awareness and uptake of resource-efficient technology options. Social networking and an organisational environment enabling the replication of promising resource-efficient technologies will be developed. Living conditions for the poor in partner countries will be improved through the establishment of 5,000 green enterprises and training of 25,000 people in the implementation and maintenance of resource-efficient technologies.

Approach

Partnerships and networks will be set up for bi-directional information and knowledge sharing at the local, national and international levels. Networks for incubation and scale-up will include partnerships with local entrepreneurs, local government bodies, the corporate sector, service providers and financial institutions. Programme activities will include capacity and awareness building through networks and the mass media as well as knowledge dissemination and transfer through workshops and exposure visits.

Outputs

A global platform for knowledge and technology sharing will be developed, enabling the circulation of best practice manuals for resource-efficient habitat technologies. **Six pilot projects** will be completed in the course of five years, with two projects being undertaken on each continent. Customised eco-technology toolkits will be generated for each partner country, and at least one partnership with a financial institution and at least one partnership with a private sector institution will emerge on each continent.

III. Green Enterprises for Community Empowerment

Statement

The project will produce a self-sustaining model for the training and incubating of green entrepreneurs to scale up community based sustainable innovations.

Community worker explaining the brick-making technology to a Yatri

Problem Analysis

Best practices are not being implemented on the large scale for several reasons: lack of access to streamlined credit from banks and other financial institutions by the general population in developing countries; lack of understanding of legal processes, standards, norms, regulations and policies; low awareness of existing opportunities; lack of critical mass in enterprise development.

Planned Outcomes

The project will **create 50,000 green enterprises** and result in a two to five-fold increase in revenue generation by the entrepreneurs. At least 100 masters will undergo training and accreditation.

Approach

An awareness campaign will deploy a range of communication tools and media to disseminate knowledge about the programme and the concept of entrepreneurship. Prospective participants will be encouraged to apply with an enterprise idea, which will be evaluated through a set of predefined criteria – potential for encouraging community participation, social benefits, sustainable and green methods and a strong business case. Training will be provided in partnership with business institutes to design required training modules and to customise existing modules. Mentoring and support with access to credit, facilitating partnerships with marketing and branding companies, exchange visits and community dialogue will be provided in the context of a network for entrepreneurs.

Outputs

A system of accreditation will be developed in order to connect recognised training and skills with markets. Training modules and manuals as well as case studies detailing best practices will be produced. A final impact assessment report will provide an impartial evaluation of project outcomes.

5. Moving Forward

The TARAgram Yatra 2011 exposed participants to sustainable resource management approaches and on-the-ground practices in green development helping the practice to policy connect.

Group consultations resulted in the production of three concept notes outlining the way forward in future international efforts on streamlining resource use, sharing scalable technologies, implementing ecologically responsible habitat construction and addressing poverty and deprivation in developing regions.

The **TARAgram Yatra 2011** has become a benchmark in capacity building and a landmark annual event catalysing interactions between international development professionals and the inhabitants of Bundelkhand whose community efforts are making sustainable growth a reality in a region known for its lack of access to livelihood opportunities, adequate water supply and reliable energy sources.

Yatris exploring Women's Enterprise Development Stall

TARAgram Yatra 2011 – Agenda

Date	Time	Session Type	Details
21st Nov			▪ Participation in Press Conference (New Delhi) ▪ *Arrival at TARAgram, Orchha (Late night)*
22nd Nov	09.30 – 12.30 hrs	**Session I**	▪ Plenary : Inaugural Session ▪ Introduction of Participants and the Workshop ▪ Introduction to the concepts of Green Growth and resource efficiency ▪ Holistic approach to Sustainable Development - presentations by DA, Participants from South and South East Asia
	14.00 – 18.00 hrs	**Field Visits**	▪ Exposure visit to villages exemplifying renewable energy models and safe water and sanitation practices
	18.30 – 20.00 hrs	**Cultural Show**	▪ Sound and Light Show – the History of Bundelkhand at the Orchha Fort
23rd Nov	09.00 – 11.00 hrs	**Session II**	▪ Introduction to the semi-arid rural context- Bundelkhand enroute to Resource Center ▪ Plenary - Briefing - DA in Bundelkhand - *TARAgram Mela*
	11.30 – 16.00 hrs	**TARAgram Mela**	▪ *TARAgram Mela* initiatives towards 'Green Growth' in the Bundelkhand region
	16.30 – 17.30 hrs	**Session III**	▪ Plenary - Sharing of experiences from the Field Visits and the Mela - moderated discussions amongst participants
	19.30 – 22.00 hrs	**Special Dinner**	▪ Special Dinner for Workshop participants, UNEP-IRP and SC members
24th Nov	08.30 – 13.00 hrs	**Field Visit**	▪ Exposure visit to villages showcasing various Sustainable Development Practices
	14.00 – 16.30 hrs	**Session IV**	▪ Group Sessions - Moderated Discussions on scaling up and policy mechanisms ▪ Plenary - Panel Discussion – scaling up and policy mechanisms
25th Nov	09.00 – 13.00 hrs	**Session V**	▪ Group Work: Developing ideas for collaborating research and analysis
	14.30 – 16.30 hrs	**Session VI**	**Valedictory Session**
			▪ *Arrival at New Delhi (Late night)*

TGY Participants Profiles

Mr. Sunil Acharya

Research and Policy Officer, Clean Energy Nepal

Mr. Sunil Acharya
Research and Policy Officer, Clean Energy Nepal

- **Research, Writing and Translation -** Sunil Acharya is currently Research and Policy Officer in Clean Energy Nepal (CEN). Over the past four years, Mr. Acharya has been involved in various research projects on Climate Change Vulnerability Assessment and Adaptation Planning in Nepal. Sunil has written, edited and translated several newsletters, policy papers, briefing papers and training manuals for Climate Change Awareness and Advocacy.

- **Leadership –** Mr. Acharya has conducted training for District Stakeholders as well as Teachers and Youth on Climate Change, and led building campaigns. He received the Climate Change Young Researcher Grant by NYCA/Embassy of Finland in Nepal.

Education: He holds a Master of Science (MSc) degree in Environmental Management from Pohkara University, Nepal.

Ms. Jacqueline Aloisi

UNEP International Resource Panel Member

Ms. Jacqueline Aloisi
UNEP International Resource Panel Member

Jacqueline Aloisi de Lardere serves on the UNEP International Resource Panel, and is a board member of E+Co, which makes clean energy investments in developing countries.

- **Public Service** – Ms. de Lardere was Director of UNEP's Division of Technology, Industry and Economics (DTIE) and the Former Assistant Executive Director of UNEP. She has also served on the scientific committee of France's Agency for Environment and Energy (ADEME).

Education and Training: Jacqueline Aloisi de Lardere holds an MBA from Insead.

Mr. (Dr) Surendra Babu

District Development Manager in Jhansi, Uttar Pradesh

Mr. (Dr) Surendra Babu
District Development Manager in Jhansi, Uttar Pradesh

As a development Banker and trained as a rural livelihood expert , he served in the different part of the country like Jammu (J&K), Bhopal(M.P) and Jhansi (U.P.) in various capacities in NABARD

- He is leading a campaign for financial inclusion for rural poor specially for women groups, village development programme, promotion of farmers institutions, strengthening capacity of the civil society organization, financial institution and provides expert technical guidance to State and Central line departments for the Rural Livelihood programmes in Bundelkhand region.

- Under his leadership, the first tribal development programme based on Horti based livelihood initiated in U.P. part of Bundelkhand region, supported by NABARD.

Education: Dr. Babu has completed M.Sc and Doctoral degree in Horticulture with specialization in Floriculture and Landscaping in 1989 and 1992 respectively.

Ms. Maria Jose Baptista

UNEP Consultant

Ms. Baptista is a Consultant of the Sustainable Consumption & Production Branch, Division of Technology, Industry and Economics, UNEP.

Ms. Maria Jose Baptista
UNEP Consultant

Mr. K. A. Bandula Chandrasekara
Project Coordinator, Energy Forum, Sri Lanka

- **Public Service --** Mr. Chandrasekara is a Member of Board of Management, Sri Lanka Sustainable Energy Authority, Ministry of Power and Energy, Member of the Apex Body of the "Pilisaru", National Solid Waste Management Programme, Ministry of Environment and Natural Resources.

- **Project Implementation and Management** -- Twenty years experience in implementing projects related to the rural energy service delivery and renewable and cross-sectoral energy applications, urban waste management and eco-sanitation, environment protection in industrial areas, consumer and industrial labor rights. Expertise in community mobilisation and empowerment and institutional networking areas. Represented number of regional and international forums on rural energy and environment development programmes.

Mr. K. A. Bandula Chandrasekara
Project Coordinator, Energy Forum, Sri Lanka

Mr. Abhijit Chatterjee

Freelance Consultant

Mr. Chatterjee has over 10 years' experience in the environment, energy and development field. He is a former associate of Development Alternatives, a leading organisation focused on sustainable development (Senior Environmental Economist, 1999 - 2002) and of Winrock International India (Programme Officer, Climate Change and Finance, 2002-2003). Mr. Chatterjee contributed to the creation of the Eaga brand in South Asia through a number of projects across the energy – environment space. He was a member of the Operating Board at Eaga India.

Mr. Abhijit Chatterjee
Freelance Consultant

- **Public Service --** Mr. Chatterjee was consultant to The World Bank (developing 250-kW biomass based power generation projects for rural electrification in Bangladesh). He has served the United Nations Development Programme (UNDP) office in Bangladesh where he was

part of the Sustainable Environment Management Programme as an International Expert. In addition, Mr. Chatterjee has served with UNDP / UNOPS offices Thailand and Timor Leste (East Timor).

- **Independent Consulting --** He was an independent consultant (2003 - 2007), and is Guest Faculty of the School of Public Systems Management, Indian Institute of Social Welfare and Business Management (IISWBM), Kolkata.

Ms. Tran Chung Chau

Coordinator of the Climate Change Working Group and Disaster Management Working Group in Vietnam (NGO Group)

Mr. Chau has been involved in advocating for voices and roles of local non-governmental organisations and community-based organisations in Vietnam, and dedicated in representing the vulnerable communities.

Education: Mr. Chau completed a Master's degree in Public Policy at Sydney University.

Ms. Tran Chung Chau
Coordinator of the Climate Change Working Group and Disaster Management Working Group in Vietnam (NGO Group)

Ms. Elizabeth Colebourn

Coordinator – TA & Partnership, Programme Development Department

Ms. Colebourn joined LEAD Pakistan in March 2011 as the Partnerships and TA Coordinator for the Climate & Development Knowledge Network – CDKN, which LEAD is implementing in Asia. She brings to LEAD a unique international perspective, having previously worked in Dar es Salaam, Brussels and New York.
Her experience lies in climate change and development policy-making and research.

- **Networking and Policy Building --** As CDKN works through partnerships with policy experts and research institutions, Ms. Colebourn's role is to strengthen and expand these relationships as well as to expand CDKN's work in Asia.

- **Coordination and Research --** Elizabeth previously worked in the Overseas Development Institute (ODI), a think-tank in her hometown, London, where she was a Project Coordinator. Prior to this, she also worked as a researcher on climate change policy in the European Parliament and also has experience working in the US Senate, United Nations Secretariat and for NGOs in Tanzania and South Africa.

Education: Elizabeth holds a Master's in International Political Economy from the London School of Economics (LSE).

Ms. Elizabeth Colebourn
Coordinator – TA & Partnership, Programme Development Department

Mr. Nong Davith

Programme Manager for Water Supply, Sanitation and Hygiene Programme
World Vision Cambodia (WVC)

Mr. Nong Davith
Programme Manager for Water Supply, Sanitation and Hygiene Programme, World Vision Cambodia (WVC)

Mr. Nong Davith has been working for WVC since 2005 as a Programme Manager. He also looks into the strategy and direction of programmes, donor and fundraising, management and leadership, technical support component, research, project design, stakeholder management, liaison with government and ngo community in Cambodia, cross-cultural communication, capacity building and internal coordination within WVC.

- Water, Sanitation and Hygiene (WASH) Management: Program Manager for WASH, WVC: 2005-Present
- Relief /Mitigation and Commodity Management: Program Officer for ERDM and Commodity Management, WV Cambodia: 2003-2005

Education: Graduated from Phnom Penh University, Master of Rural Infrastructure Development

Ms. Roseleen Gurung

Project Manager in Tarayana Foundation, Bhutan

Ms. Roseleen Gurung
Project Manager in Tarayana Foundation, Bhutan

Ms. Roseleen Gurung has been working with Tarayana Foundation for the past four years in the capacity of a Programme Officer. Tarayana is an NGO working to empower rural communities through targeted interventions that are gender balanced with the voices of both the sexes given equal importance.

- **Project Management –** Ms. Gurung has managed projects geared towards enabling women to empower themselves through scholarship programmes, capacity building, income generating opportunities through formation of self-help groups and facilitating women to take active roles in decision-making processes.

Education: Ms. Gurung holds a Bachelor's degree in English and a Master's degree in social work with a specialisation in Medical and Psychiatry from Madras Christian College, Chennai.

Dr. Maarten Hajer

UNEP International Resource Panel Member

Dr. Maarten Hajer
UNEP International Resource Panel Member

Mr. Maarten Hajer is Director of the Netherlands Environment Assessment Agency and Professor of Public Policy, University of Amsterdam and Member International Resource Panel.

- **Academic Work -** Maarten Hajer is professor of Public Policy at the University of Amsterdam since 1998.
- **Public Service -** The Dutch Cabinet appointed him as Director of the PBL Netherlands Environmental Assessment Agency (PBL – Planbureau voor de Leefomgeving) in 2008. He continues his professorship part time. As director of the PBL Netherlands Environmental Assessment Agency Hajer is responsible for the strategic assessments and policy evaluations to facilitate political deliberation and decision making, ranging from environment, nature,

land use to water and transport. While primarily focused on the Dutch political decision making PBL is also active for international bodies, such as the European Commission, OECD and UNEP.

Education: Hajer earned a D Phil from the University of Oxford.

Dr. Yvan Hardy

UNEP International Resource Panel Member

Dr. Yvan Hardy
UNEP International Resource Panel Member

DR. Yvan Hardy is the Former Chief Scientist of Natural Resources, Canada.

- **Public Experience -** Yvan Hardy serves currently as Board Chairman of the Canadian Carbon Programme research network, set up to promote understanding of carbon release and sequestration, mostly in forests. He was Chief Scientist for Natural Resources Canada from 2003 to 2007. He has served on the Board of Directors of the Canadian Foundation for Climate and Atmospheric Sciences and on the Canadian Science Committee of UNESCO.

- **Academic Experience -** He was formerly the Dean of Forestry and Geomatics at the Université Laval.

Education: Hardy earned his PhD in forest entomology from the New York State College of Forestry and his MSc in silviculture from Université Laval in Quebec.

Dr. Edgar Hertwich

UNEP International Resource Panel Member

Dr. Edgar Hertwich
UNEP International Resource Panel Member

Dr. Edgar Hertwich is a member of the UNEP International Research Panel, and was the lead author of the 2009 Panel report, *Priority Products and Materials* and leads the
Working Group on the environmental impacts of products and materials. He is the lead author of the report "The Environmental Impacts of Production and Consumption: Priority Products and Materials." Currently, he leads the panel's assessment of the environmental and resource impacts of greenhouse gas mitigation technologies. He is a member of the editorial board of the *Journal of Industrial Ecology*.

- **Academic Work -** Hertwich is also Professor of Energy and Environmental Systems Analysis at the Norwegian University of Science and Technology.

- **Public Service --** He is also lead analyst for the Global Energy Assessment, used to help decision-makers provide sustainable energy services while reducing emerging risks and threats.

Education: Hertwich earned a PhD in energy and resources from the University of California, Berkeley, in the USA.

Dr. Lea Kauppi

UNEP International Resource Panel Member

Dr. Lea Kauppi
UNEP International Resource Panel Member

Dr. Lea Kauppi is the Director General of the Finnish Environment Institute.

- **Research –**Her research expertise is on the environmental impacts of agriculture on aquatic ecosystems, and the development of integrated assessment tools for acidification and the environmental impacts of climate change.

- **Public Service –** Dr. Kauppi also chairs the Working Group on monitoring and assessment of the UNECE convention on transboundary rivers, lakes and groundwater. She has also served on many panels, including for the European Commission's Directorate General for Environment. She also serves on the Scientific Advisory Committee of the International Institute for Applied Systems Analysis.

Education: She holds a PhD in limnology from the University of Helsinki, Finland.

Dr. Alice Kaudia

Environment Secretary, Ministry of Environment, Kenya

Dr. Alice Kaudia
Environment Secretary, Ministry of Environment, Kenya

Alice Kaudia is Environment Secretary at the Ministry of Environment and Mineral Resources Kenya.

- **Leadership -** She has served in senior leadership and management positions in government, Civil Society Organisations, International Environment Conservation Organisations, Forestry Research Institution and the private sector.
- **Position**– She is the first Environment Secretary in Kenya since 2008, the first woman regional director for the International Union for Conservation of Nature - eastern Africa regional Office
- **Consultancy work –** Dr. Kaudia has served as a consultant for the Food and Agriculture Organisation of the United Nations, CARE International (Kenya and Somalia) and the European Union through Development Researchers Network of Italy.
- **Academic Work --** She has published in the areas of agro forestry, gender and forestry, forestry extension and technology transfer.

Education: She graduated from the University of Nairobi, and received a PhD in Forestry Extension and Development by the University of East Anglia, UK, 1996.

Dr. Ashok Khosla

UNEP International Resource Panel Co-chair

Dr. Khosla Co-Chairs the United Nations Environment Programme International Resource Panel, and is the Founder & Chairman of Development Alternatives Group.

Ashok Khosla co-Chairs the Resource Panel along with Ernst Ulrich von Weizsacker. He has participated in discussions surrounding the development of the 2009 Panel publication, *Priority Products and Materials.*

Dr. Ashok Khosla
Co-chair of UNEP International Resource Panel

- **Sustainable Development –** Dr. Khosla is one of the world's foremost experts on the environment and sustainable development. When he was Director of UNEP, Khosla launched Infoterra, a global environment information exchange. He also helped develop the first course on the environment at Harvard University. He has served on the boards of the World Conservation Union, and the International Institute for Sustainable Development and advised the World Bank and the United Nations Development Programme (UNDP). He is currently Chairman of Development Alternatives, an NGO that promotes environmentally friendly technologies, Chairman of the Center for our Common Future and is President of the IUCN environmental planning commission.

Education: Dr. Khosla earned his Ph.D. in experimental physics at Harvard University.

Dr. Marina Fischer-Kowalski

UNEP International Resource Panel Member

Dr. Marina Fischer-Kowalski
UNEP International Resource Panel Member

Marina Fischer-Kowalski is Director of the Institute of Social Ecology, and a member of the Faculty for Interdisciplinary Studies, University of Klagenfurt, Vienna.

- **Work on Decoupling -** Marina Fischer-Kowalski co-authored the report *Decoupling the use of natural resources and environmental impacts from economic activity: Scoping the challenges.* In addition to serving on the Working Group on decoupling, she coordinated the review of the biofuels report. She also participated in a scenarios workshop in Brussels in 2010 representing the scenarios Working Group.

- **Public Addresses --** She presented results from the Panel report *Globalizing patterns of natural resource use in relation to human development* at the 18th session of the UN Commission on Sustainable Development (UNCSD) in 2010 from *The world economy's use of natural resources* at Rio+20 in 2010; and in a keynote address at the World Resources Forum in Davos, Switzerland in 2009, from *Future Scenarios for Global Material Flows.*

- **Scientific and Administrative Activity --** Fischer-Kowalski is Director of the Institute for Social Ecology in Vienna. She has developed a model of society-nature interactions. She chairs the scientific advisory board of the Potsdam Institute on Climate Impact Research and is Vice President of the European Society of Ecological Economics.

Education: Dr. Fisher-Kowalski earned a PhD in sociology from the University of Vienna, in Austria.

Mr. Ram Kishan

Practical Action, Nepal

Ram Kishan has worked for national and international development for over

14 years.Ram joined Practical Action in Nepal to work on DIPECHO IV action plan for South Asia; he is endeavouring to establish early warning systems with integration of climate change as part of current DIPECHO intervention.

Mr. Ram Kishan
Practical Action, Nepal

- **CSDRM** – Mr. Kishan has led the regional initiative for South Asia on developing framework for Climate Smart Disaster Risk Management (CSDRM).
- **International Experience:**Ram has worked with international development organisations such as Action Aid and Christian Aid, UK for nearly 10 years.
- **GCAP** - Ram is also the global lead for GCAP (largest civil society network) on issue of global governance and work on G20, at the same time he is passionate about advocating for the cause of climate justice.
- **CANSA** - With his involvement on climate change negotiations he has worked with civil society at regional level in South Asia with Climate Action Network, South Asia (CANSA).

Education: Ram is a post graduate in Social Work with degree in Law from India. He holds long working experience in programme management, monitoring, evaluation, donor compliance.

Mr. Ravindra Kumar

Drinking Water Expert

Mr. Ravindra Kumar
Drinking Water Expert

Mr. Ravindra Kumar has served as an Executive Engineer in the Irrigation Department of Uttar Pradesh; he is now Water Manager in conjunctive use planning for water, works in the field of social and environmental sustainability, and is involved in preparing the river basin water plan for the state of Uttar Pradesh. In addition, he presently serves in SWARA as Drinking Water Expert and Manager Administration.

- **Publications and Conferences --** Mr. Kumar has published more than seventy-five research papers produced for National and International Conferences. He has organised numerous international conferences on energy flow and many national conferences in Uttar Pradesh; the subjects groundwater, the drainage master plan and regulatory authority framework, among many others many more for Uttar Pradesh.

- **Lectures and Administrative Work --** He has served as a faculty at the National Institute of Technology, Allahabad and regularly delivers lectures for the UPWALMI, Uttar Pradesh Disaster Management Authority, Grameen Vikas Sansthan, and Bakshi Ka Talab, Lucknow.

Education: Mr. Kumar is a mechanical engineer by qualification.

Ms. Christine Lagarenne

Member of the UNEP International Resource Panel

Ms. Lagarenne represents the Department of the Economy of Natural Resources and of Risks, French Ministry of Ecology, Energy, Sustainable Development and Sea.

Ms. Christine Lagarenne
Member of the UNEP International Resource Panel

Ms. Sylvie Lemmet

Director, Division of Technology, Industry and Economics, UNEP

Ms. Sylvie Lemmet
Director, Division of Technology, Industry and Economics, UNEP

Mr. Henrik Hagen Olesen

UNEP International Resource Panel Member

Mr. Henrik Hagen Olesen is a Senior Adviser of the Danish Environment Protection Agency.

- **Public Service --** previously he was Head of Pesticides, Gene Technology & Chemicals Inspectorate Service Division, Danish EPA, and administered national regulation, chemical control and enforcement, as well as GMO (genetically modified organism) regulation. He has also served as Head of Chemical Division, Danish EPA, where he negotiated and developed chemicals legislation. Other appointments include being Head of Finance Division, Center for Corporate Management, Ministry of Environment; Adviser, National Forest and Nature Agency, Ministry of Environment; Chief Technical Adviser, Ministry of Foreign Affairs.

Mr. Henrik Hagen Olesen
UNEP International Resource Panel Member

Dr. Shaoyi Li

Member of the UNEP International Resource Panel

Shaoyi Li is Head of the Integrated Resource Management Unit, Sustainable Consumption & Production, Division of Technology, Industry and Economics, UNEP.

Dr. Shaoyi Li
Member of the UNEP International Resource Panel

Ms. Anne Miehe

UNEP International Resource Panel Member

Ms. Miehe represents the Department of Ecological Resource Efficiency and Soil Conservation, Federal Ministry for the Environment, Germany.

Ms. Anne Miehe
UNEP International Resource Panel Member

Dr. Walter Alberto Pengue

UNEP International Resource Panel Member

Dr. Walter Alberto Pengue is Professor of Ecological Economics at the Periurban Studies Institute (ICO), Universidad Nacional de General Sarmiento.

- **Scientific Work --** Walter Pengue is an agricultural engineer specialising in plant genetics at the University of Buenos Aires in Argentina. He teaches a doctoral course on ecological economics at the University of Buenos Aires and is a steering committee member of the Argentine Institute for Economic Development. He has authored books and articles on the impact of new technologies on agriculture, sustainable models of agriculture development and production alternatives.

- **Leadership --** He is a coordinator for European Academic Cooperation for the sustainable use of photosynthesis products and optimum resource transformation. He also served as scientific director of a biofuels workshop, which has become a model for other academic institutes. Together with Stefan Bringezu, Walter Pengue is the co-chair of the working group on land and soils of the International Resource Panel.

Dr. Walter Alberto Pengue
UNEP International Resource Panel Member

Mr. Imtiaj Rasul

Program Development Adivisor in Gram Bangla Unnayan Committee (GUC)

Mr. Imtiaj Rasul
Program Development Adivisor in Gram Bangla Unnayan Committee (GUC)

Mr. Imtiaj Rasul is working as Program Development Advisor of Grambangla Unnayan Committee (GUC) since 2006.

- He is actively involved in GUC's intervention program and research related to human development, poverty, migration, rural housing, public health, education, ethnic and religious minorities, marginalized community, environment, social policy and development strategy.
- As a participatory development specialist since 1996, he has worked with the Program for Research on Poverty Alleviation, Grameen Trust (sister concern of Grameen Bank - Nobel peace prize winner of 2006), Research Initiatives, Bangladesh (RIB), MRC Mode Ltd. and Grambangla Unnayan Committee (GUC).

Education: Imtiaj graduated from Winona State University, USA (Bachelor of Arts) in 1996 majoring in Political Science-concentration in International Studies and minor in Sociology. In 2005 he has also completed a Post Graduate Diploma in Organized Self Help Housing, Lund University, Sweden.

Dr. Maria Amelia Rodriguez

UNEP International Resource Panel Member

Dr. Maria Amelia Rodriguez
UNEP International Resource Panel Member

Dr. Rodriguez is President of the Brazilian Society for Ecological Economics.

- **Leadership and Public Service --** Maria Amélia Rodrigues da Silva is President of the Brazilian Society for Ecological Economics, and has advised the country's Secretary on Minerals and Minerals Transformation.
- **Academics --** She has taught economics at the University of Amazonas and the University of Pará.
- **Writing and Editorial Work --** Rodrigues da Silva has written extensively about sustainability in the minerals and mining sector and she is Editor of *Ecological Economics Bulletin* and a member of the editorial council of *Brazil Mineral Magazine.*

Ms. Merja Saarnilehto

Environmental Protection in Trade and Industry, Ministry of the Environment

Ms. Merja Saarnilehto
Environmental Protection in Trade and Industry, Ministry of the Environment

Ms. Janet Salem

UNEP Programme Officer

Ms. Salem is an Associate Programme Officer of the Sustainable Consumption & Production Branch, Division of Technology, Industry and Economics, UNEP.

Ms. Janet Salem
UNEP Programme Officer

Mr. Amitabh Kumar Singh

Trustee and Working Committee member of Debate

Mr. Singh has been in the development sector for over 15 years. His specialises in Policy Analysis, developing strategies for Capacity Building and initiating Participatory Processes in activities related to development and social change.

- **Capacity Building –** Mr. Singhs has been supporting Capacity Building initiatives for State Government in the sector of Decentralisation and local self-governance in Madhya Pradesh for last 10 years and Chhattisgarh for last 7 years.
- **Research and Documentation –**Preparation of Guidelines for decentralised district planning for Government of Madhya Pradesh and Government of Chhattisgarh in 2007.

Education: Master of Arts in Economics with specialisation in Internal Trade and Economic policy, University of Allahabad (1990)

Mr.Amitabh Kumar Singh
Trustee and Working Committee member of Debate

Mr. Manoj Kumar Singh

Chief Functionary at Vikas Sahyog Kendra

- Worked as a consultant for 3 watershed projects with *Society For Rural Industrialization* and on 20 watershed projects with *Alternative for India's Development* (1997- 2000)
- Worked on development of software on Watershed development with the Department of Electronics, Government of India (1997-2000)
- Worked as the Chief functionary of Vikas Sahyog Kendra since 2000 on projects focusing on Institution building, Natural Resource Management and Food and Livelihood Security with Dalits, Tribes, Women and the Disabled

Education: Diploma in Civil Engineering

Mr. Manoj Kumar Singh
Chief Functionary at Vikas Sahyog Kendra

Dr. Anna-Bella Sirban-Manalang

UNEP International Resource Panel Member

Dr. Anna-Bella Sirban-Manalang
UNEP International Resource Panel Member

Anna Bela Siriban-Manalang furnished comments during the preparation of the 2009 Panel report, *Assessing Biofuels*.

- **Leadership --** Siriban-Manalang is Director of the Centre for Lean Systems at De La Salle University in the Philippines. She is a board member of the Asia-Pacific Industrial Engineering & Management Society.
- **Research and Consulting --** Her research and consulting over 20 years has been devoted to quality, systems improvement, and standardisation, performance measurement and monitoring, with comprehensive work in the metals, mining, furniture and housewares sectors, and she has been involved in designing and implementing total quality management and related programmes, monitoring and other research studies funded by the World Bank and the Asian Development Bank.

Education: She holds a doctor of philosophy in industrial engineering from the Graduate School of Engineering at De La Salle University.

Mr. Kuno Zurkinden

Senior Policy Advisor, Government of Switzerland

Mr. Kuno Zurkinden
Senior Policy Advisor, Government of Switzerland

Mr. Zurkinden is Senior Policy Advisor Green Economy and Trade for the Federal Office for the Environment, Switzerland.

Ms. Ida Marxen Sønsergaard

UNEP International Resource Panel Member

Ms. Ida Marxen Sønsergaard
UNEP International Resource Panel Member

Ms. Marxen Sønsergaard represents the Environmental Strategies Division, Eco-Innovation Unit, of the Danish Ministry of the Environment.

Ms. Kamna Swami

Infrastructure Leasing and Financial Services Professional

Ms. Kamna Swami has been working with Infrastructure Leasing and Financial Services (IL&FS) Environmental Infrastructure and Services Limited for the last five years.

Ms. Kamna Swami
Infrastructure Leasing and Financial Services Professional

- **Project Development and Advisory Work --** Ms. Swami's professional experience includes providing advisory services and project development activities in general and the waste management sector in Public Private Partnership model. Having earlier worked with the Centre for Urban and Regional Excellence (CURE) in New Delhi, she also has hands-on experience in implementing the Cross Cutting Agra Programme (CAP), co-financed by FIRED & Chemonics International, USAID.

- **Community Building –** Ms. Kamna Swami has expertise in community participation aspects of Municipal Solid Waste Management projects. She has been working on the conceptualisation and implementation of a pilot project involving door-to-door segregated waste collection activities with the cooperation of local Civil Society Organisations.

Education: Ms. Kamna Swami holds an M. Tech (Urban and Regional Planning) from the School of Planning, Centre for Environmental Planning and Technology (CEPT), Ahmedabad and a Master's of Geography from the Delhi School of Economics, University of Delhi.

Dr. Mark Swilling

UNEP International Resource Panel Member

Dr. Swilling is a UNEP International Resource Panel Member, and co-founder of PLANACT, an urban development NGO.

Dr. Mark Swilling
UNEP International Resource Panel Member

- **Academic Work --** Professor, Sustainable Development Planning and Management, University of Stellenbosch, and Academic Director of the Sustainability Institute and Programme Coordinator of Sustainable Development at the University of Stellenbosch in South Africa.

- **Policy Involvement --** He has written extensively on public policy issues, and has 30 years of experience in urban planning and sustainable cities, including large-scale, community-based housing projects. He was involved in policy development for restructuring the governance of Johannesburg.

Education: Professor Swilling received a PhD from the University of Warwick in the UK.

Ms. Emmanuelle Swynghedauw

Project Manager, Department of Ecology, Energy, Sustainable Development and Sea, France

Ms. Swynghedauw is Project Manager at the Sub-Directorate of climate change and sustainable development, Directorate of European and International Affairs, Department of Ecology, Energy, Sustainable Development and Sea, France.

Ms. Emmanuelle Swynghedauw
Project Manager, Department of Ecology, Energy, Sustainable Development and Sea, France

Mr. Helge Wendenburg

UNEP International Resource Panel Member

Mr. Helge Wendenburg represents the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Mr. Helge Wendenburg
UNEP International Resource Panel Member

Ms. Vositha Wijenayake

Executive Coordinator of SLYCAN, Sri Lanka

Ms. Wijenayake is the Executive Coordinator of SLYCAN, an organisation working on climate change and human rights-related issues. She is a socio-legal researcher and a lecturer of law and French.

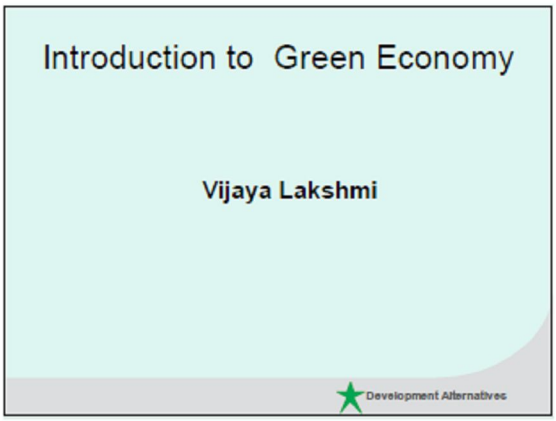
- **Research --** Her latest research work include the NGO report "The Wait of Justice" on the Lessons Learnt and Reconciliation Commission of Sri Lanka and "LGBT Rights in a Land of Suppression" on the LGBT community in Sri Lanka.

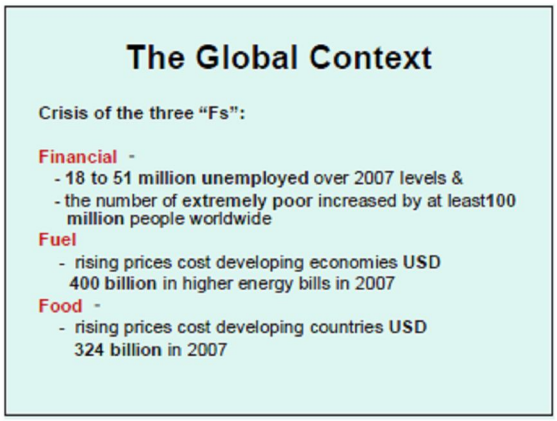
- **Youth Leadership --** She has been actively involved in the UNFCCC process since of 2009, and has worked as the interim focal point to the UNFCCC secretariat of the youth constituency during COP17, inter sessions held in Bangkok. Currently, she is leading the SLYCAN global team comprising youth from five continents in its participation at COP17 of the UNFCCC in Durban.

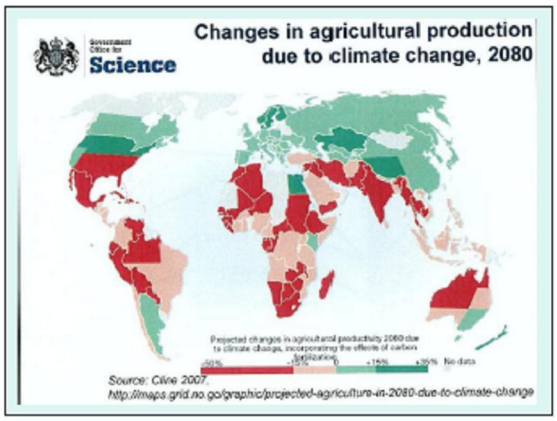
Education: Ms. Wijenayake has her LLB (Hons) from University of London, UK and BA (Hons) from University of Kelaniya, Sri Lanka. She is currently pursuing her LLM in international environmental law and human rights law from the University of London, UK.

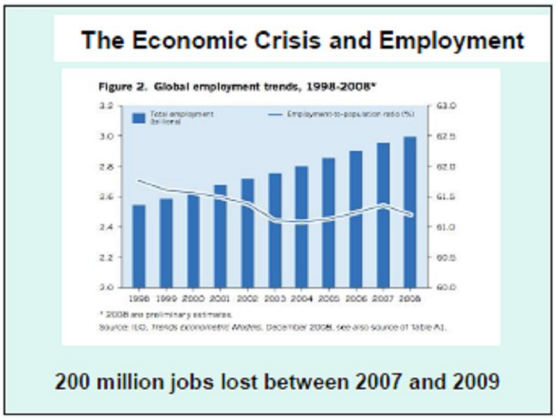
Ms. Vositha Wijenayake
Executive Coordinator of SLYCAN, Sri Lanka

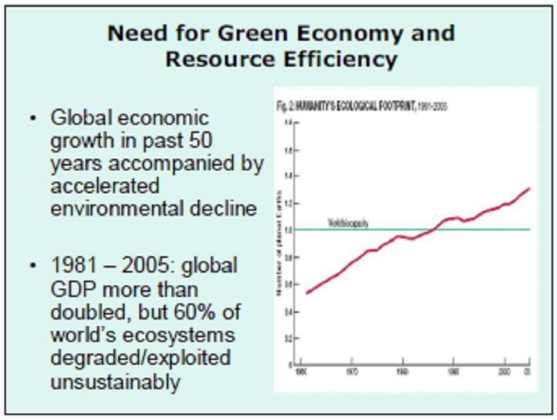
Presentations











Some Green economy concepts

- **A low carbon economy:** part of a GE measured by the **carbon level** of economic activities
- **Green growth:** GDP growth subject to **green conditions** as well as focusing on **green sectors** as new growth engines - growth in a GE is green growth
- **Green jobs:** jobs in **green sectors**, also known as green collar jobs
- **Circular economy:** an economy in which the waste from one **production/consumption process is circulated** as a new input into the same or a different process – one of the approaches to a GE
- **Ecological economy:** an economy **subject to ecological principles** (eg biodiversity & carrying capacity) as well as utilizing ecological functions to contribute to both the economy and ecosystems (eg organic farming) – one of the approaches to a GE

UNEP's Working Definition of a Green Economy

*A **system of economic activities** related to The production, distribution and consumption of goods and services that result in **improved human well-being** over the long term, while not exposing **future generations** to significant **environmental risks** and **ecological scarcities.***

Green Economy : as a Multi Dimensional System-GEC Definition

Green economy is a **system** based on building blocks such as :

- low-carbon energy, infrastructure and transport;
- sustainable systems of food production, water and sanitation, and waste;
- ways of protecting and sustainably using biodiversity; green jobs, decent work,
- sustainable lifestyles and livelihoods that ensure social justice and equity, and set real measures for progress and wellbeing;
- investment in green sectors, environmental 'accounting' and the introduction of **new business models** and policy reform.",

Multiple Goals of GE

The green economy **shall be fostering development that is:**

sustainable,
equitable,
low carbon,
ecosystem intact,
bottom up and top down and
gender inclusive,
Cost effective

***innovations** in value chains with **co-benefits** and **cash out flows'** is the key to achieve all at once and not to prioritize one over the other.*

TARAgram YATRA

Green Economy

Working definition emerged as:

"A Green Economy is a system that creates sustainable livelihoods by reducing our carbon footprint, strengthens social capital and produces green products and services, thus creating green decent employment opportunities (green jobs) to lift millions out of poverty while simultaneously regenerating the environment"

Measures of Green Economy?

- Increase in **green investment**
- Increase in quantity & quality of jobs in **green sectors**
- Increase in share of **green sectors** in GDP
- Decrease in **Energy/resource use** per unit of production
- Decrease in **CO2 and pollution level**/GDP
- Decrease in **wasteful consumption**

ILO's definition of green jobs

Jobs are green :

- when they help reduce negative environmental impact ultimately leading to environmentally, economically and socially **sustainable enterprises and economies.**
- More precisely green jobs are **decent jobs** that:
  - **Reduce consumption of energy and raw materials**
  - **Limit greenhouse gas emissions**
  - **Minimize waste and pollution**
  - **Protect and restore ecosystems**

Green economy: Action Areas

Domestic policy initiatives:

- Perverse subsidies
- Incentives & taxes
- Land use and urban policy
- Integrated management of freshwater
- Environmental legislation
- Monitoring and accountability

International policy architecture:

- International trade
- International aid
- Global carbon market
- Global markets for ecosystems services
- Development and transfer of technology
- International coordination of the Global Green New Deal

Rethinking the Economic Recovery: A global Green New Deal

1 Revive the world economy, create new and decent jobs, and protect the vulnerable

2 Reduce carbon dependency, ecosystem degradation, and water scarcity

3 Eliminate persistent poverty by 2015.... achieve the MDG's

From : Edward B. Barbier, "A Global Green New Deal", UNEP, Feb 2009

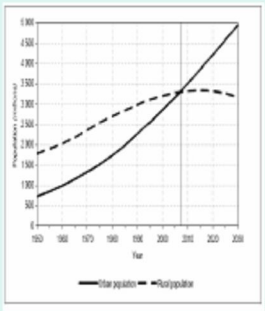
Green Fund share of Economic Stimulus

1	South Korea	79%
2	China	34%
3	Australia	21%
4	France	18%
5	United Kingdom	17%
6	Germany	13%
7	USA	12%
8	South Africa	11%
9	Mexico	10%
10	Canada	8%
12	Spain	6%
13	Japan	6%
14	Indonesia	2%
15	Italy	1%

Investing in Green Sectors

- Renewable energy
- Clean tech : materials & energy efficiency
- Low carbon cities , buildings & transport
- Waste management & mitigation
- Ecological infrastructure
- Biodiversity-based businesses

Sustainable Cities



- Delivering the smart city: The GER will give a guidance plan for mayors to improve sustainability and growth in cities.

Green Buildings

Energy efficient buildings: Investments in improved energy efficient buildings = **2-3.5m jobs** in Europe & USA.

In *Australia* a proposed **US$ 3b green housing over 4 years** is expected to reduce green house gas emissions by 3.8mtons/year = 160,000 jobs

In *the US* it is estimated that **US$ 100b** to improve **energy efficiency** of building & cities **over 4 years** will generate 2m new jobs.

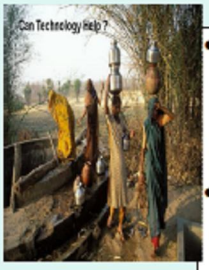
Renewable Energy

- About **2.3 million jobs** in renewable energy sector in comparison to 2 m employed in oil & gas refining industry in '99.
- Projected investments of **US$ 630b** in renewable energy sector by 2030 would translate into at least **20 m jobs**.

Renewable energy: case study

- *China:* RE sector generates output worth US **$ 17 bill & employs 1 mill.**
- *Nigeria:* a biofuels industry based on casava & sugar can provide **200,000** jobs
- *India:* **900,000 jobs** could be created in the biomass gasification by 2025
- *Bangladesh:* At least **20,000 jobs** have been created with the uptake of 3 renewable energy technologies (PV solar home systems biogas facilities, & improved cooking stoves)

Water



- Market for water supply, sanitation & water efficiency estimated at **US$ 253 bn & is expected to grow to US$ 658 bn** by 2020.
- Estimated Investment of USD **15 bn** per annum.

Sustainable Agriculture

- Organic agriculture sustains health of soils, ecosystems & people
- Provides more than **30% more jobs/ha** than non-organic
- China has **increased its allocation of land for organic prod** from 300,000 ha in '05 to 3.5 mill ha in '06
- In Ethiopia alone, **6 bn is being invested** in land management during a period of 15 years.

Forests

- Many communities directly depend for their livelihoods on non timber forest products.
- Sustainable forest management can:
  - create massive employment, provide for livelihoods,
  - make a significant contribution to the fight against climate change,
  - combat desertification and land degradation.

Two "Green Economy" leaders ....

- Mexico
  - "Green Fund"
  - combined gov't/biz vision and implementation
  - cogeneration
  - will announce goals for 2012. Going for stats and research-backed policy change...
  - they have own 'Stern Review' (3x cheaper now vs later)...
  - "Green Agenda" as growth driver...
- Korea
  - President's "Green Growth National Vision" of August '08
  - Jan'09 "Green New Deal"
  - Significant "Green" components of Fiscal Stimulus Package..
  - .....700,000 of 1 mio new jobs
  - .....$ 28 billion / $ 36 billion total
  - Cleaning 4 main rivers, Reforestation, Renewables, Buildings...

A global Green Economy Report

An in-depth analysis and guidance on macroeconomic contribution from investing in **10 green sectors:**

- Renewables
- Industries
- Transport
- Buildings
- Cities
- Waste
- Forests
- Fisheries
- Agriculture
- Tourism

A global Green Economy Report

Supported by innovative financing mechanisms as well as policy reforms:

- Taxes
- Subsidies
- Pricing
- Trade
- Market access
- Green technologies
- IPRs
- Standards
- R&D
- Training
- Education

Evidence of green economies

- 2.3 million jobs in renewable energy now to grow to 20 million by 2030
- USD 253 bn market for water supply, sanitation,& water efficiency now to grow to USD 658 bn by 2020
- EU & US: green buildings to create 2-3.5 million jobs
- Organic agriculture provides more than 30% more jobs/hectare
- China: 10 million jobs in recycling; and renewable energy output at USD 17 bn/year employing 1 million

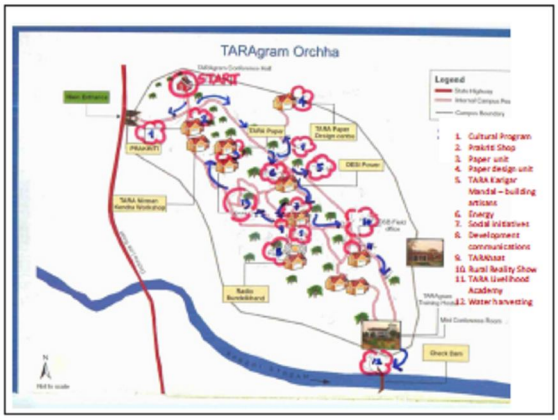
Let's design

A Blue Print for the Green Economy of Asia!!

The challenge is Innovation for Inclusive Growth

UNEP WEBSITES and PUBLICATIONS

- GEI : www.unep.org/greeneconomy
- Environmental Governance : http://www.unep.org/environmentalgovernance/Introduction/tabid/341/language/en-US/Default.aspx
- Green Jobs Report, September 2008 http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf
- Global Green New Deal Report, December 2008 http://www.unep.org/greeneconomy/docs/GGND_Final%20Report.pdf
- UNEP Policy Brief on the GGND, March 2009 http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf



Resource Efficiency and Green Transformation: Driving Change in Asia

- Poverty Alleviation is key focus
- Economic growth will require resource use
- Inclusive growth is a key concern
- Resource conservation and regeneration will be critical for ensuring and sustaining human well being
- Transformation in growth paths and development paradigms will require – technologies / know-how /partnerships/financing/new markets/new tools...

Core Messages of Reports

- Resources are fundamental for people, planet and prosperity.
- Scarcity is a concern.
- Resource use is increasingly inequitable.
- Resource Efficiency is an opportunity.

Focus: Strategies for scaling up Green Growth & Resource Efficiency

- Relationship between national- international policies and how are they being influenced
- Facilitating mechanisms - enabling developing countries to move towards green growth (knowledge partnerships, technology transfer etc.)
- New pathways to upscale resource efficiency and green growth (market-based instruments, voluntary approaches etc.)
- Challenges and barriers faced by policy makers in the design and promotion of strategies to scale-up green growth models

Development Alternatives

1983 to ...

resource efficiency and green growth in action

Development Alternatives

Sustainable Development

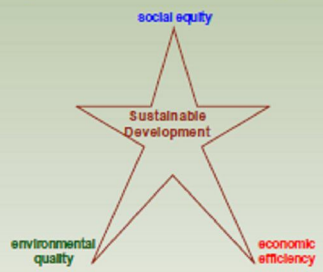
"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

Two key concepts:

- the concept of needs
- the idea of limitations

Development Alternatives

Development Alternatives Group - Vision



The Development Alternatives Group is dedicated to bringing about a better balance among the basic prerequisites of sustainable development - social equity, environmental quality and economic efficiency

Development Alternatives

Development Alternatives Group - Mission

The key to achieve sustainable development is the creation of sustainable livelihoods in large numbers

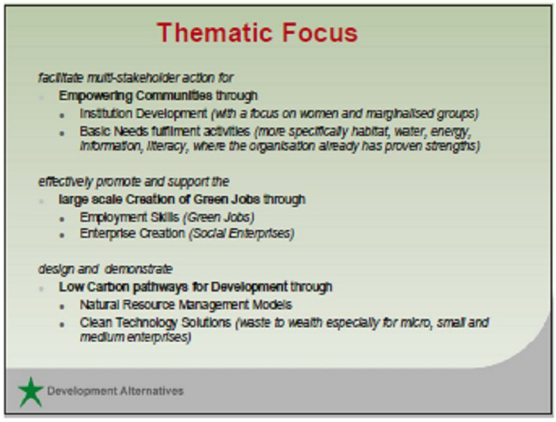
Development Alternatives

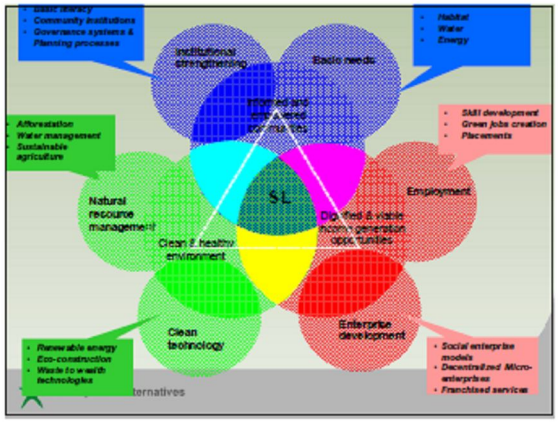
DA Group Mission – *Its Meaning*

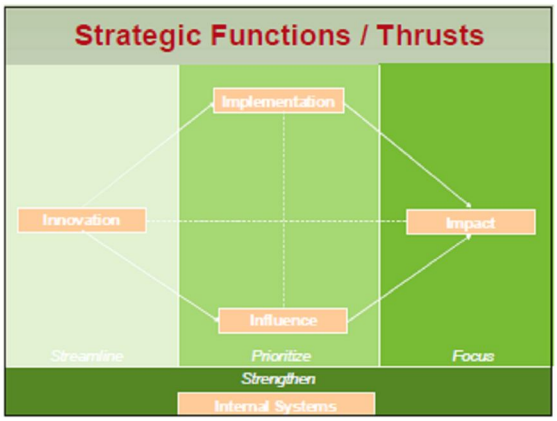
Sustainable livelihoods implies..... informed and empowered communities .....with access to dignified and viable income generation opportunities .....and a clean and healthy environment.....in the same space and time

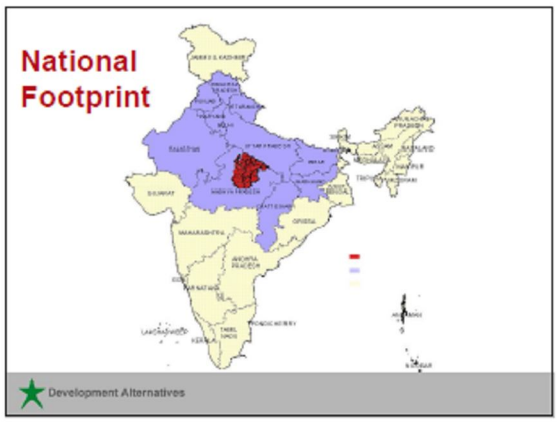
Development Alternatives

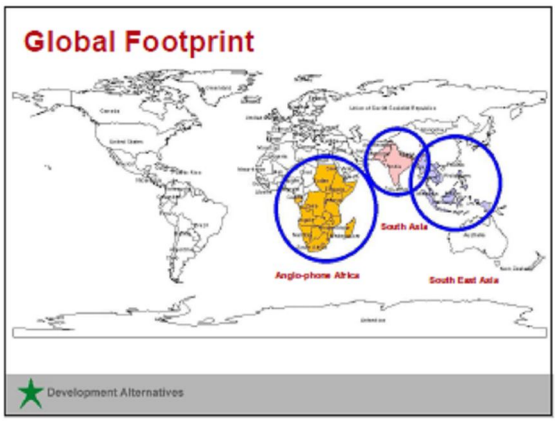
Thematic Focus

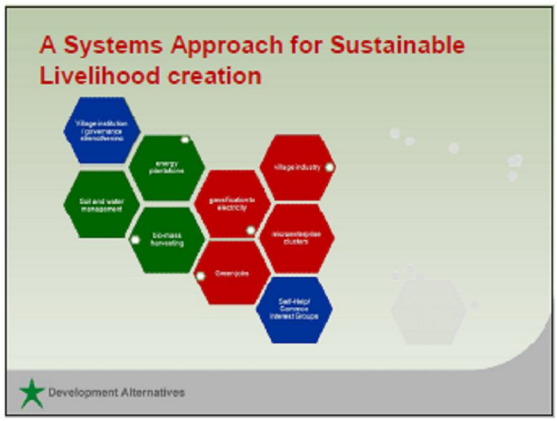

Thematic Focus
facilitate multi-stakeholder action for
Empowering Communities through
Institution Development (with a focus on women and marginalised groups)
Basic Needs fulfilment activities (more specifically habitat, water, energy, information, literacy, where the organisation already has proven strengths)
effectively promote and support the
large scale Creation of Green Jobs through
Employment Skills (Green Jobs)
Enterprise Creation (Social Enterprises)
design and demonstrate
Low Carbon pathways for Development through
Natural Resource Management Models
Clean Technology Solutions (waste to wealth especially for micro, small and medium enterprises)
Development Alternatives


Institutional strengthening
Basic needs
Natural resource management
Clean & healthy environment
Employment
Clean technology
Enterprise development

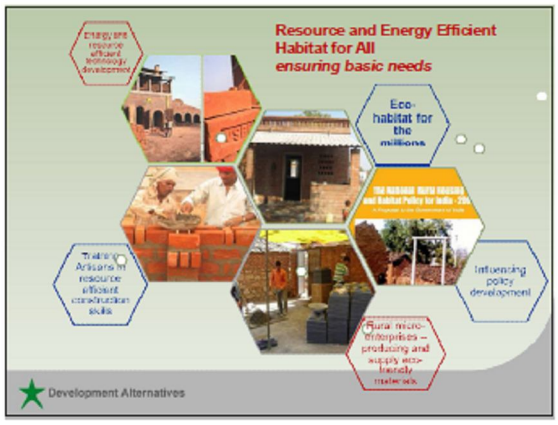

Strategic Functions / Thrusts
Implementation
Innovation
Impact
Influence
Streamline
Prioritize
Focus
Strengthen
Internal Systems


National Footprint
Development Alternatives


Global Footprint
South Asia
Anglo-phone Africa
South East Asia
Development Alternatives


A Systems Approach for Sustainable Livelihood creation
Development Alternatives


Resource intensive construction and shelter gaps
Development Alternatives


Resource and Energy Efficient Habitat for All
ensuring basic needs
Eco-habitat for the millions
Influencing policy development
Development Alternatives


Inefficient Agriculture and food insecurity
Development Alternatives


Sustainable management of natural resources
ensuring food security
Capacity building and institutional strengthening
Development Alternatives


Energy insecurity and low livelihood potential
Development Alternatives


Decoupling resources from growth –
Renewable energy for sustaining lives and livelihoods
Lighting a million lives
Enabling economic activities
Village Energy Planning
Development Alternatives

Deforestation and livelihood insecurity

Development Alternatives

Wealth from waste – Green Jobs sustainable incomes

Development Alternatives

Sidh BABA Farmers Club

- Experimented with sprinkler and line sowing methods
- Set up experimental plots in fields
- As a collective purchased new plots- took up raised bed sowing with additional inputs of labour costs
- The club purchased a reaper and inter loaned its use.
- In the season of 2010 – demonstrated 20% profits
- Calculated savings in water and use = 33%
- Reduction in Carbon emissions = 9.2 tCo2 by 100 farmers – one year, 29% water savings

Development Alternatives

The Sahariya Sangram Samiti

- 23 women from Sahariya tribe engaged to work at the paper unit, TARAgram
- In 15 years, have retained their jobs – producing quality recycled paper for urban – individual and corporate customers
- Have regular incomes, savings, children at school
- Only 2 children added across the 23
- Control group – 25 children

Development Alternatives

The TARA Karigar Mandal

- Resource Efficient construction can be cheaper – bringing value to both customers and service providers
- Now 150 artisans – earn upto 100 days from eco-construction services
- Wage enhancement – from 150 to 300 per day
- Skill enhancement – from nil to semi-skilled and skilled masons leading to ; 22 Master masons, 11 Trainers,
- 20 first time artisans
- Providing products as well as services -
- In one year – 1700 sqft construction, 115 tons carbon saved, 20% saving in soil

Development Alternatives

30 years of delivering EcoSolutions

Development Alternatives

Development Alternatives in Bundelkhand

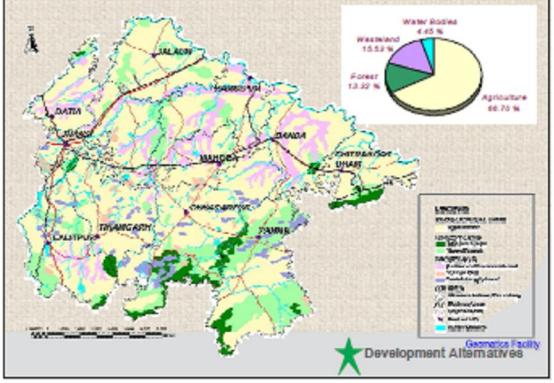
23rd November, 2011

Development Alternatives

Bundelkhand Region – *here we are!*

Development Alternatives

BUNDELKHAND REGION : Landuse Pattern



Development Alternatives

Semi-Arid Rural Region

75% dependent on agriculture and animal husbandry for livelihoods

- Recurrent Droughts
- Crop Failure
- Erratic Rainfall

Development Alternatives

DA Groups Response

Promote Sustainable Livelihoods through Green & Appropriate Technology

Participatory approaches in selection and Adoption of Appropriate Technologies

Development Alternatives

DA Groups Infrastructural Base

- Three Appropriate Resource Centers, TARAgram in
  - Orchha, Tikamgarh(M.P)
  - Pahuj, Jhansi(U.P)
  - Datia, Datia (M.P)

Development Alternatives


Natural Resource Management
– Rejuvenation of Watersheds and Wastelands
Watershed Planning and Documentation
Macro analysis through GIS applications
Micro planning through participatory techniques
Water Harvesting and Conservation
Construction of contour bunds, trenches, check dams, gully plugs
Setting up community / enterprise based management systems
Enhanced and sustained productivity from farmlands
Demonstration of improved / agriculture practices
New cropping systems and practices
Diversification of agriculture
Agro-forestry, fodder development ,Horticulture
Development Alternatives


Livelihood Enterprises and Support Systems
– Training, assistance for setting up and marketing
Farm based livelihood enterprises / systems
Household and Biomass Enterprises
Bamboo products
Medicinal plants cultivation and semi-processing
Wild seed utilisation
Vermicomposting
Setting up community / enterprise based management systems
Household and Village level Food Processing Enterprises
Spice grinding and packaging
Agri-Processing
Food Storage Enterprises
Household and Village level Livestock Enterprises
Poultry
Domestic cattle management
Milk Collection and chilling plant
Development Alternatives


Livelihood Enterprises and Support Systems
– Training, assistance for setting up and marketing
Off-farm livelihood enterprises / systems
Household and Village level Building Material Enterprises
Stone dust products
MCR, FC, etc
Vertical Shaft Brick Kiln
Household and Village level Energy Enterprises
Briquetting
Cookstoves
Biogas
Household and Village level Handicrafts Enterprises
Metal products
Paper and paper products
Fiber crafts
Woodcrafts
Pottery
Candles
Development Alternatives

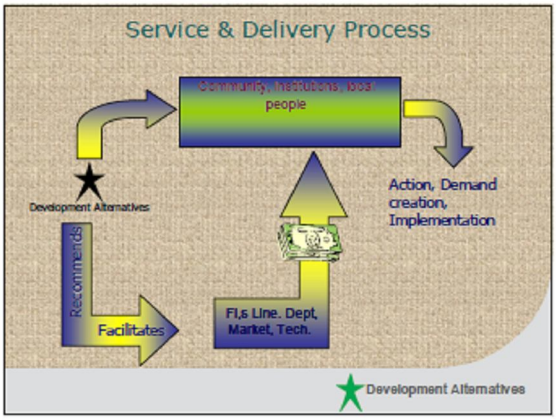

Strengthening Institutional Systems
– Set up, build capacity and link with marketing, finance and government networks
Awareness Generation
Radio Bundelkhand
Mobilising community institutions
Initiating participatory planning and documentation
Capacity Building
Undertaking community development programmes
Developing external partnerships
Network with government agencies
Network with agencies that provide technical, financial and market support systems
Market Linkages
Financial Linkages
Development Alternatives


People's Institutions
About 1000 community institutions – Self Help Groups, Water Management Committees, Farmers Group
Cumulative finances managed by these institutions : Rs. 1 Cr (USD 232,000)
Development Alternatives


Improving Quality of Life - BNF
Habitat services for the rural poor
Safe drinking water services
Securing food
Renewable Energy Services
Development Alternatives


Natural Resource Management & Clean Technology
135 water harvesting structures benefiting over 15,000 Ha of land and over 20,000 families in 100 villages.
Integrated Watershed management programme for managing natural resource in 25000 hectare of land
Demonstration of drought proofing mechanisms
Development Alternatives


Income Generation & Employment
Over 1500 micro and small IG activities
Blend of farm-non farm-services based incomes
Capacity building services
Institutional credit worth Rs. 60 Lakh (USD 140,000) to support IGAs
Development Alternatives


Service & Delivery Process
Community, Institutions, local people
Development Alternatives
Action, Demand creation, Implementation
Recommends
Facilitates
FI,s Line. Dept, Market, Tech.
Development Alternatives


Way ahead...
Single window access for development services
Development Alternatives

What is the International Resource Panel?

- **A science-policy interface**: Provides knowledge to tackle persistent & emerging challenges to use of natural resources & environmental sustainability.
- Cooperation amongst developed and developing countries to come up with an **improved understanding** of the scientific basis for **decoupling.**
- 28 Panel members, 28 SC members
- Secretariat hosted by UNEP

Objectives

- Provide independent, coherent and authoritative **scientific assessments of policy relevance** on the sustainable use of natural resources and in particular their environmental impacts over the full life cycle;
- Contribute to a better **understanding of how to decouple** economic growth from environmental degradation.

Published Reports

- **Main products: policy relevant scientific assessments** (five assessment reports launched with more than a million downloads)
  - Biofuels: Assess the environmental and social impacts throughout life cycle
  - Metals Stocks in Society and Recycling Rates
  - Environmental Impacts: Identify priority products, materials and economic activities
  - Decoupling 1: Decoupling is a key to a transition to a resource efficient green economy

Future Reports

Decoupling:
- Decoupling, cities and urban infrastructure
- Decoupling – policy and technology options

Water:
- Quantifying water productivity
- Water efficiency and water decoupling

Land and Soil resources
- Assessment of efficient and sustainable use of land and soil resources

Future Reports

Metals
- Environmental aspects of metals
- Recycling: Opportunities, Limits and Infrastructure
- Demand scenarios for metals and policy options

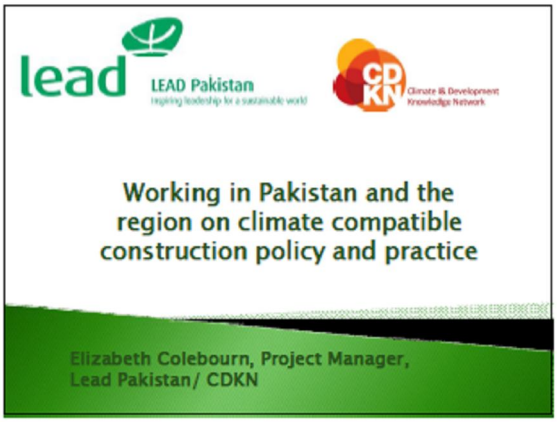
Environmental Impacts
- Environmental impacts embodied in trade
- Risks, benefits and trade-offs of GHG mitigation technologies and energy efficiency measures

Core Messages of Reports

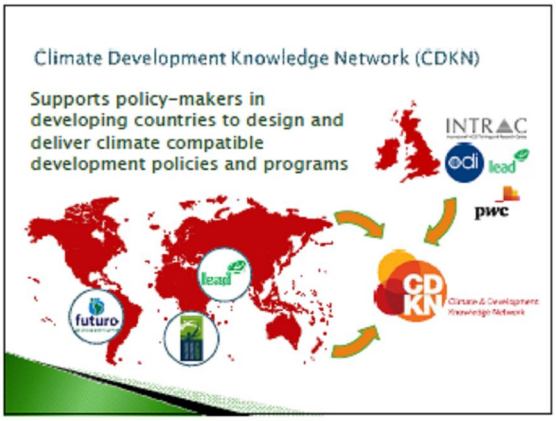
- Resources are fundamental for people, planet and prosperity.
- Scarcity is a concern.
- Resource use is increasingly inequitable.
- Resource Efficiency is an opportunity.

More information on...

www.unep.org/resourcepanel


lead
LEAD Pakistan
Inspiring leadership for a sustainable world
CDKN
Climate & Development Knowledge Network
Working in Pakistan and the region on climate compatible construction policy and practice
Elizabeth Colebourn, Project Manager, Lead Pakistan/ CDKN


lead
LEAD Pakistan
Inspiring leadership for a sustainable world
Leadership for Sustainable Development
Capacity Development
Community Empowerment
Public Policy Engagement
Networking, Partnerships
Knowledge Management
Leadership Development Programme
Community based adaptation planning
Climate Development Knowledge Network (CDKN)
Leadership for Reproductive Health
Research on human rights and the environment


Climate Development Knowledge Network (CDKN)
Supports policy-makers in developing countries to design and deliver climate compatible development policies and programs
INTRAC
odi
lead
pwc
futuro
CDKN
Climate & Development Knowledge Network

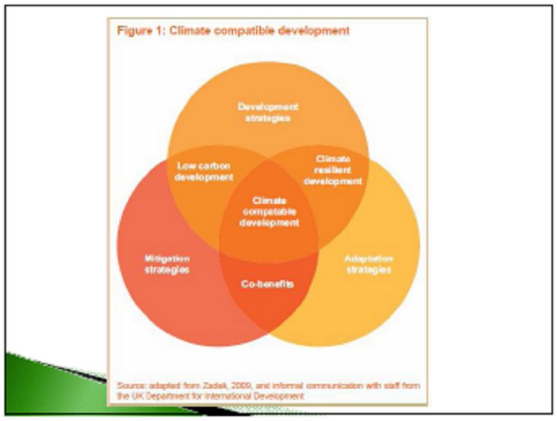
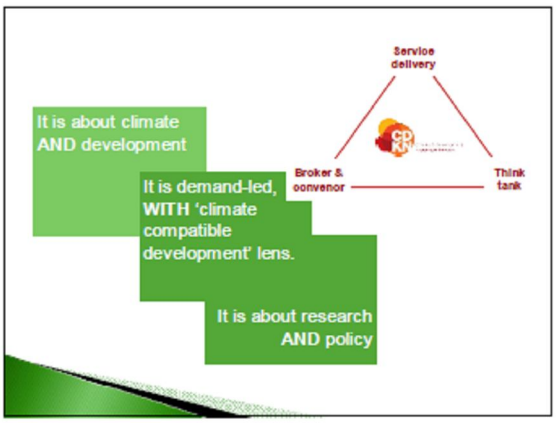
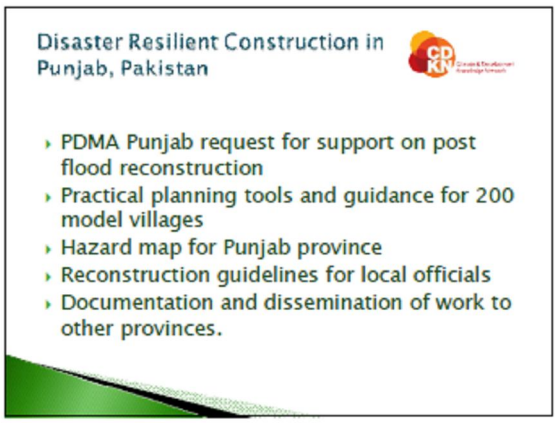


Figure 1: Climate compatible development
Development strategies
Low carbon development
Climate resilient development
Climate compatible development
Mitigation strategies
Co-benefits
Adaptation strategies
Source: adapted from Zadek, 2009, and informal communication with staff from the UK Department for International Development


Service delivery
Broker & convenor
Think tank
It is about climate AND development
It is demand-led, WITH 'climate compatible development' lens.
It is about research AND policy


Disaster Resilient Construction in Punjab, Pakistan
CDKN
PDMA Punjab request for support on post flood reconstruction
Practical planning tools and guidance for 200 model villages
Hazard map for Punjab province
Reconstruction guidelines for local officials
Documentation and dissemination of work to other provinces.

Low carbon construction in India

Promoting low carbon construction through policy engagement in rural areas and small towns:

- Construction guidelines for different kinds of disaster prone areas and climate conditions
  - Semi-Arid: Bhopal - Madhya Pradesh
  - Coastal: Bhubaneswar- Orissa
  - Hilly and wet: Shimla - Himachal Pradesh
- Policy analysis and dialogue to identify policy and capacity gaps
- Inventory of climate compatible construction techniques
- Training manuals for policy makers and practitioners

Opportunities...

- Leadership training, skills development, capacity building – construction sector, officials
- Policy dialogue, advocacy – planning, standards, codes
- Partnerships and experience sharing – linking private and public sectors.

Thank you.....

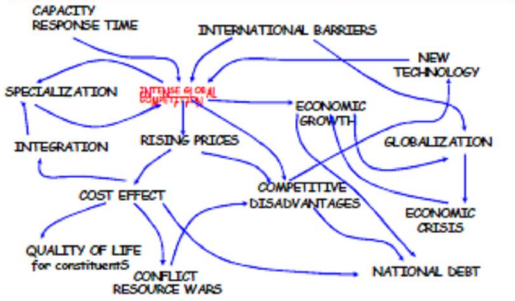
elizabeth.colebourn@cdkn.org

Integrating for Scaling Up

Dr. Anna Bella SIRIBAN-MANALANG, Ph.D.
Center for Lean Systems & Management
beng_manalang@yahoo.com
+63-9189030791
Manila, Philippines

Managing the Dynamics:

Countries are having diffficulty managing the changing dynamics of the world



Changing Success Factors

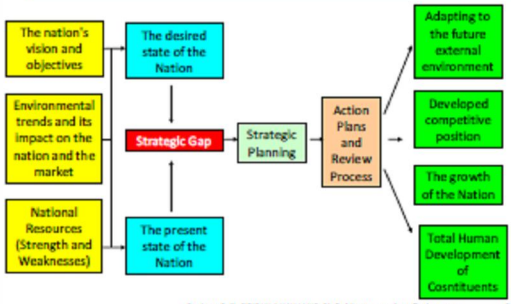
Successful nations must continually change themselves, against internal and external factors

The 2011 National Management Tools

Balanced Scorecard	Open Innovation
Benchmarking	Outsourcing
Business Process Reengineering	Price Optimization Models
Change Management Programs	Rapid Prototyping
Core Competencies	Satisfaction and Loyalty Mng.
Customer Relationship Mng.	Scenario and Contingency Pl.
Customer Segmentation	Shared Service Centers
Decision Rights Tools	Social Media Programs
Downsizing	Strategic Alliances
Enterprise Risk Management	Strategic Planning
Knowledge Management	Supply Chain Management
Mergers and Acquisitions	Total Quality Management
Mission and Vision Statements	...

Strategic Management Framework

NATIONAL STRATEGIC MANAGEMENT PROCESS

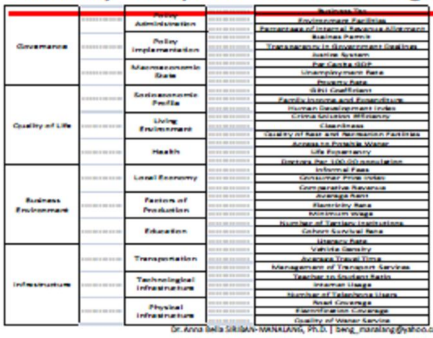


Country and City Attractiveness

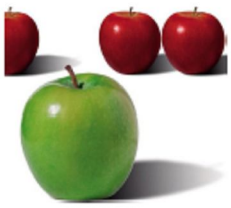
COUNTRY ATTRACTIVENESS	Weight	Point	Score
Governance	0.10	5	0.50
Policy Adminsitration	0.05	4	0.20
Policy Implementation	0.10	3	0.30
Macroeconomics	0.05	3	0.15
Quality of Life	0.05	2	0.10
Socioeconomic	0.10	3	0.30
Livability	0.10	5	0.50
Health	0.05	5	0.25
Business Environment	0.05	2	0.10
Local Economy	0.05	1	0.05
Factors of Production	0.10	1	0.10
Education	0.05	2	0.10
Infrastructure	0.05	5	0.25
Transportation	0.10	1	0.10
Technological Infras	0.10	1	0.10
Physical Infra	0.10	1	0.10

$Country\ Attractiveness = Weight_1 \times Point_1 + \ldots + Weight_n \times Point_n$

Country Competitiveness Strength

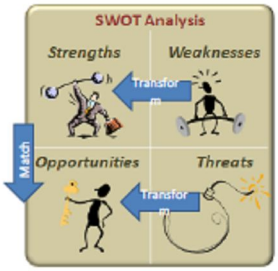


A Quote by Jack Welch



"If you don't have a competitive advantage, don't compete."

SWOT Analysis



A Quote by Peter Drucker

"Results are gained by exploiting opportunities, especially by turning problems into opportunities."

"Where Do We Want to Go?"

Critical Questions

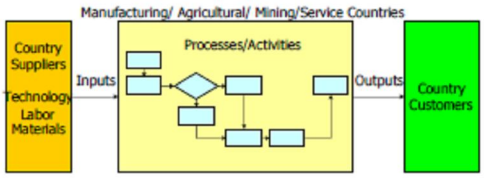
- Where your country is now?
- What it is capable of doing?
- Where it wishes to go?
- What can be done?
- What should be done?
- What are the implications?
- What are your strategic implementation strategies?

A Quote by Joel A. Barker

"Vision without action is nothing but a dream. Action without vision is simply drudgery. Vision with action can change the world."

Governance Pyramid Model

Global Supply Chain System (Trade)



Scaling Up

- Create Process owners from top-down and bottom up
- Process owners need to understand who their constituents/audience/customers are, what they want and how to provide what they want.
- Process owners are accountable and empowered to improve their work efficiently and effectively.

Voice of Audience (VOA)

- The "Voice of the Audience Or Customer" is the term to describe the stated and unstated constituency needs or requirements.

- "People want to work for their own interests and will not readily embrace technologies. These must be self sustainable and should pay for themselves.

To be a Sustainable Competitive Country

The countries must deliver

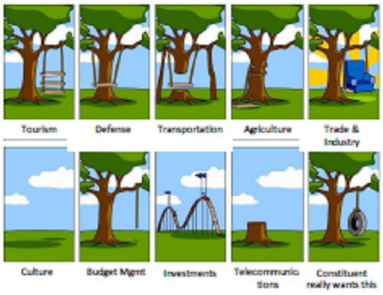
- The highest quality possible
- The lowest cost products and services
- At the shortest lead-times

in all their processes for their constituents/international trade partners/ and customers.

A Joke

An old lady sits in the park and is watching two guys working. The first guy digs a hole in the ground and the second guy is filling the hole again. The lady is astonished. This continues a couple of times and the old lady raises a question. Why is one of you digging a hole and the other one is filling it up again? Well, said one of the guys "Our colleague that normally puts in the tree, is sick today".

Communicating with Constituents



A Quote by Dr. W. Edwards Deming

"You can not hear what you do not understand."

Success = People + Process + Product

- A **Product** doesn't get produced, marketed, sold and delivered without people involved in the process.
- A **Process** is only a method by which people leverage productivity and create improved value.
- **People** is the dominant factors that influence processes and product.

"Resource productivity and efficiency happen at the individual worker level." - Anna Bella Siriban-Manalang

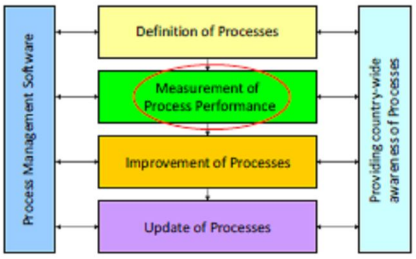
EFQM Excellence Model

Unmeasured Process

An *unmeasured* process performance goes uncontrolled and *unmanageable.*

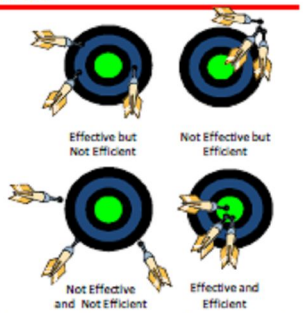
Unmanageable things cannot be improved.

Country Process Improvement Management



New Public Management: Country Governance Process Improvement Areas

- **Effectiveness:** Doing right things
- **Efficiency:** Doing things right



A Quote by Dr. W. Edwards Deming

"What we need to do is learn to work in the system, by which I mean that everybody, every team, every platform, every division, every component is there not for individual competitive profit or recognition, but for contribution to the system as a whole on a win-win basis."

Avoid Resource waste at all levels: TIMWOOD

- MUDA is **'TIMWOOD'** (Transport, Inventory, Motion, Waiting, Over-production, Over-processing, Defects).

- 8 Waste ... 'Skills'.
- **"No resource is a resource unless we know how to use it."**


My vision 2030
One world where workers have green decent jobs, using green technology, that make up green industry, working together for green growth of the green economy, enabled by energetic society managed by organized states
A world where people engage in lifestyle activities for total human development where there is gender equity, racial equality and joy.
A world where nations know and accomplish their unique specific role in international trade and sustainability and indeed "found their place under the sun"

Enhancing Resource Efficiencies

Water

- **Critical Focus Issue**
  - Irrigation for Agriculture (Water Use efficiency)
- **Problems**
  - Water Availability
  - Changing Precipitation Patterns
  - Inefficient storage of water
  - Inefficient Use
  - Distribution Basic Tech

- **Causes**
  - Deforestation
  - Soil Erosion
  - Climate Change
  - Encroachment of Land

Interventions

- **Innovations/ Solution**
  - Dam/ storage – wells /ponds
  - Rainwater harvesting
  - (Storage)
  - Drip irrigation
  - Sprinkler irrigation / Micro irrigation
  - Efficient Flood irrigation systems
  - Crop pattern/ inter crops/
  - Crop Variety
  - Decentralized Distribution
  - Solar Pumps
  - Green Houses/ Shade net

Scaling-up

- **Finance**
  - Government Subsidies for efficient technologies via WSCOs "Water (efficient) Service Companies"
  - Access to Credit for efficient technologies
- **Skills + Capacities**
  - Local Level Governance – Planning integrated Approach
  - Community Capacity building , awareness raising of updated knowledge on use of technologies

- **Regulations**
  - Target / caps on Industrial use link to offset for projects on irrigation
  - Conservation regulations e.g. groundwater exploration
  - Integrated Water Management plans at local level
  - Ensure level playing field between market players
  - Simplify bureaucracy
- **Integration with Markets**
  - Offset Schemes
  - Ensure access – When scarcity market force can work but government regulation needed safety net

- **Social Instotutional Systems**
  - Vital to work through community systems
  - Need to work through local officials to build community integration
  - Converge government programmes to save human resource, time etc
- **Critical Partnerships**
  - Public + Private -> to develop new technologies
  - Community Institutions + Government Officials -> to ensure government programmes implemented
  - Research Institutes + Govt. +Pvt + NGOs + community -> to develop new innovations

- **Tools/ Communication**
  - Communication systems/ knowledge sharing at all levels
  - Expert assessment of state of policy regulations / gaps
  - Highlights best practices
  - Networking
  - Tailored messages to target audience
  - Targeted policy recommendations

Key Messages

- Community awareness raising + empowerment is pre requisite to success
- Governance mechanism connecting players to be transparent + interactive + empower the lowest level
- Innovative schemes to link private + Public e.g. offset schemes for industrial water use

Concept Note

Since the past two decades, the Development Alternatives (DA) Group has been working on models for development that emphasize the philosophy of "more with less". With a mission to create sustainable livelihoods at a large scale, the Group has addressed issues of optimizing resource use for economic activities through design and development of appropriate technological solutions, resource management systems and institutional models.

The TARAgram Yatra is being organized at the Rural Livelihoods Resource Center of the DA Group located in Bundelkhand, Central India and development professionals from the Asia-Pacific region will also be participating as part of a capacity building workshop around the theme ***'Resource Efficiency and Green Growth in Action'***.

Members of the UNEP International Resource Panel (IRP) and Steering Committee (SC) will participate in interlinked field visits and discussions. Application of simple energy efficient and optimizing methods in water use for agriculture, renewable systems for energy, resource saving construction systems and waste to wealth models of economic growth will be showcased through a *TARAgram Mela*[i]. This 'Mela' will be a working exhibition of practices and technologies engineered and implemented by the DA Group. Highlights of the exhibition would include onsite demonstration of social enterprise models, community radio (live), decentralized energy systems and many more.

The participants will also have an opportunity to further explore DA's work on the ground by journeying through the villages in Bundelkhand. This would expose participants to some of DA Group's efforts to engineer a transformation of rural Bundelkhand to sustainable growth.

Field visits will be interspersed with moderated discussions on conceptual understanding of resource efficient growth for developing societies. The IRP and SC participants will be joined in certain sessions by policy makers from the Asian and South Asian countries and by local government and community representatives from the Central Indian region of Bundelkhand.

Discussions on what is possible at a micro-level will be subjected to systemic analysis for scaling-up and understanding facilitatory environments required for supporting change at a large scale. The juxtaposition of experiences from the participants and practical demonstrations in a challenging context of rural central India will hopefully test many theories and generate new thought towards innovative solutions.

[i] A working exhibition of practices and technologies engineered and implemented by the Development Alternatives Group

TARAgram Yatra 2011

Development Alternatives
B-32, TARA Crescent, Qutub Institutional Area, New Delhi 110016, India
Tel: 91 11 6542 8857 / 2656 5370 / 2696 1497
Fax: 91 11 2685 1158
Email: taragramyatra@devalt.org
Website: www.taragramyatra.org, www.devalt.org

Development Alternatives

जहाँ है हरियाली।
वहाँ है खुशहाली॥
MINISTRY OF ENVIRONMENT & FORESTS
GOVERNMENT OF INDIA

UNEP

International Resource Panel