

For sustainable

MOUNTAIN DEVELOPMENT

in the greater Himalayan region

Renewable Energy Options in the Himalaya



Women, Water, Energy
and the Millennium
Development Goals

Saving Global Carbon
to Benefit Local
Communities in the
Himalayan region

Enhancing Market Access
through Gravity Ropeways

Contents

- Women, Water, Energy and the Millennium Development Goals: Lessons Learned and Implications for Policy 3
- Saving Global Carbon to Benefit Local Communities in the Himalaya 9
- Community-managed, Low-cost Ropeways: Learning from the Experience of Uttaranchal 13
- Enhancing Market Access and Livelihood Options in the Himalayan Region through Gravity Ropeways 16
- Success Stories in Water Harvesting from Bajeeana and Naila Villages, Almora District, Uttaranchal 19
- Women as Energy Entrepreneurs: Successes from a Pilot Project in Phobjikha and Limukha Villages, Bhutan 21
- Promoting Technological Interventions Related to Water and Energy Resources: A Case Study from Nepal 23
- The Carbon Market as an Emerging Livelihood Opportunity for Communities of the Himalaya 26
- Institutional Profiles 28
- Centre News 29

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Cover Photo: A woman with a water canister and firewood in the background, Bhutan (Elizabeth Khaka, UNEP, Nairobi)

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From the Director General's Desk...

Dear Friends of ICIMOD,

The energy needs of the poorest mountain people cannot be met by electricity alone. Although electrification is able to provide lighting in the mountains, its high cost makes electricity unsuitable for cooking and heating in poor rural households. Connecting small, scattered rural settlements to electricity is also not cost efficient. The energy requirements of the mountains are better met through the sustainable development of decentralised, renewable community-based energy options, in technology packages appropriate for specific areas. This has been the focus of ICIMOD's programme on energy.

Renewable energy technologies (RETs) reduce greenhouse gas emissions and pressure on forests. They also cut down the amount of time women spend collecting fuel and water, and reduce the health hazards of heavy loads and smoky kitchens. These technologies can promote the economically and environmentally sound development of energy resources, particularly biomass.

Over the years, ICIMOD's programme on energy has implemented initiatives that focus on renewable energy technologies. Action research has identified and implemented appropriate technology packages by communities and/or by local NGOs in selected areas of the Himalaya.

The lives of women all over the world are intimately connected to water, and yet women in the greater Himalayan region continue to face hardships related to fetching water. It is almost impossible to involve women in new livelihood opportunities without reducing the time they spend in collecting and managing the water and energy needs of their households.

ICIMOD executed a two-year project, 'Capacity Building of Women for Energy and Water Management in the Rural Areas of the Himalaya on a pilot basis in India, Nepal, and Bhutan. The project is making a marked difference in the lives of participating women and their families. The experiences and lessons learned from this project have been encapsulated in three publications, including policy guidelines, a training manual, project learning, and in a documentary film which hopes to help policy makers and rural development practitioners replicate and up-scale similar projects in their own regions.

This issue of the newsletter also features ICIMOD's research through the project 'Kyoto: Think Global, Act Local' into how the carbon saved in community-managed forests can be brought under the Clean Development Mechanism. Readers will also be interested in the gravity and diesel ropeways technology which could provide an appropriate solution to the challenge of accessibility in the mountains.

On another note, the Board of Governors, on my request, has commenced the search for the next Director General of ICIMOD (see announcement in this issue). Completing the recruitment process in 2006 will enable my successor to participate in an evaluation of the results of the fourth Quinquennial Review and take on the responsibility of the next Medium Term Action Plan and the resource generation this requires. This timetable, under which I would hand over responsibility one year before the completion of my full second four-year term, should ensure a smooth and sustainable transition for ICIMOD and its various mountain development initiatives.

Finally, I would like to thank all partner institutions who contributed to this volume, and express special thanks to Dr. Kamal Banskota, Programme Manager for ARID, who served as thematic editor for this issue. We look forward to your feedback and suggestions for improvement.

With best wishes for 2006.

Sincerely,
J. Gabriel Campbell, Ph.D.

Women, Water, Energy and the Millennium Development Goals: Lessons Learned and Implications for Policy

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Water and energy are essential resources for human survival and well-being. Improved access to these critical resources holds some of the key to reducing poverty and achieving the Millennium Development Goals (MDGs).

Worldwide, two billion people continue to rely on traditional biomass fuels for cooking and heating, while some 1.1 billion people lack access to safe drinking water. Hundreds of millions – mainly women and children – spend hours daily gathering firewood and water, often from considerable distances, for household and other needs. Women throughout the world continue to have fewer options and opportunities than men, and in many countries women face overt inequalities, marginalisation, and discrimination. Of the 1.3 billion who live in poverty, 70% are women. Women perform two-thirds of the world's work but earn one-tenth of the world's income. Their exclusion from decision-making in many countries has led to the failure of many poverty alleviation programmes.

Throughout the Himalayan region, women face the burden of fetching heavy loads of water and

fuelwood and spend hours in drudgery to meet the water and energy needs of their households and farms. They spend extended periods with their children in smoky kitchens – a health hazard to both mother and child. Often, young children, especially girls, are unable to attend school because they are needed to help with water and energy chores at home. Without reducing the time women spend daily on collecting and fetching these resources, and the drudgery associated with these activities, women simply do not have time to participate in any new livelihood opportunities. Liberating poor women from this vicious cycle of time poverty¹ can be a powerful entry point for reducing poverty and achieving the MDGs.

Any new interventions for women should aim to reduce the hours and drudgery of work, and the risks to life and health. It should enhance equity in the



Sanat Chakraborty

Women and children collecting firewood from jhum land in the West Garo Hills, Meghalaya, India

¹ Time poverty occurs when the rate of return on human assets is so low that the labour time (metabolic energy) has to be largely allocated to these survival activities.

sharing of work and benefits and should widen women's options for more productive work through time and energy savings. Women need energy- and water-related technologies to meet water and energy needs and to escape from the deep-rooted time poverty they face. In addition to these practical needs, these technologies also help to improve the status of women's livelihoods (*productive needs*) especially to generate more income as well as for women's empowerment (*strategic needs*).

This fundamental relationship between women, water, and energy has not been adequately recognised in past development efforts. This is a major reason why women's contributions to mainstream decision-making processes in the Himalayan region has not been fuller. Although integrated water and energy initiatives can be a powerful entry point for empowering women and reducing poverty, this issue has not received the attention it deserves. The few examples that have stressed the central role of women in water and energy management remain fragmented, and learning from them has yet to be coherently assembled.

The Millennium Declaration adopted by 189 states at the United Nations Millennium Summit in 2000 and the eight key goals (MDGs) to be achieved by 2015 have become the international roadmap for working on poverty eradication, health, education, and environmental sustainability. Although there is no specific target on energy in the MDGs, and only Goals 7 and 3, respectively, focus on water and gender/women (gender equality and empowerment of women), none of the MDGs, it has been widely recognised, can be fully achieved without ensuring adequate and equitable access to water and energy.

Since women are the primary collectors, users, and managers of both these resources at the household level, focusing on their roles and needs in relation to these two basic needs can make a significant difference in meeting these MDGs.

ICIMOD and UNEP launched the project, 'Capacity Building of Women for Energy and Water Management in the Rural Areas of the Himalayas' in three countries – Bhutan, India, and Nepal, with financial support from SIDA in recognition of the gap. The project sought to empower women to meet their water and energy needs in a way that frees them from excessive drudgery and long hours spent collecting water and fuel, and allows them to increase their income and improve their status in society. In other words, addressing the water and energy needs of women served as an entry point for addressing their productive and strategic needs. Women were placed at the forefront of the design and implementation of energy- and water-related technological interventions based on their prioritised needs by enhancing their energy and water management capacities through various forms of training.

The impacts and lessons that have emerged from the project are discussed below, and the ways in which interventions have contributed to meeting a number of MDG targets at the local level are detailed. Some implications for designing gender-sensitive water and energy policies are also highlighted.

Impacts and lessons learned

Existing water and energy policies and programmes in the countries of the study remain largely gender neutral, failing to address the special circumstances and needs of women. Nor are there specific policies and programmes for combining the needs and role of women in water and energy management in an integrated manner at the household and community levels.

Simple and cost-effective water and energy technologies that women can control and manage themselves and which bring positive change to their lives, the lives of their families, and their communities, even in a short period of time, continue to be overlooked in development programmes. While saving time and reducing drudgery are valuable impacts in their own right, the time saved from adopting these technologies can be harnessed to generate income. This multiple impact makes them attractive and appealing for women.



Women constructing an improved cooking stove in Nepal

Through improved access to water and energy technologies that reduce drudgery, save time, and improve health, women are able to meet their practical needs. Productive needs are met by technologies that help women to better utilise the time saved from accessing water and energy for income generating activities. Strategic needs are fulfilled by building women's capacity to organise themselves in ways that empower them to choose technologies that suit their needs and improve their standing in society.

Technology is not gender neutral, and as such, technological options must remain open and be driven by development needs. A major conclusion of the project is that integrating women in activities that address the problems associated with water and energy is not merely a question of technologies that best serve their needs, but more important, how to enable and empower women to choose from among options those that meet their needs, improve their livelihoods, and their overall status in society. The formation of women-only groups has helped this process, with women taking charge of the technologies.

Women are emerging as energy entrepreneurs and leaders, running an LPG depot, technology demonstration centres, and producing and selling solar dryers and improved cooking stoves.

The pilot projects in Nepal have been selected internationally as examples of good practice by the Wuppertal Institute for Climate, Environment and Energy². Mainstreaming examples of good practice is already taking place. For instance, the Dhankuta District Development Committee has replicated the project in Vedetar Village Development Committee. The Ministry of Environment, Science and Technology of His Majesty's Government of Nepal is incorporating the project concept into its future programmes on gender mainstreaming in the water and energy sector. The project has gathered valuable experiences and lessons, some of which are briefly highlighted below.

- **The right entry point is crucial to ensuring, women's participation and empowerment.** While participation holds the key to the successful delivery of water and energy services in rural areas, reducing women's drudgery and workload and focusing in particular on integrated water and energy initiatives should be an entry point for enabling them to participate in livelihood opportunities. The issues common to

water and energy are often examined separately, but clearly integrated water and energy planning can address drudgery while widening women's options to meet their productive and strategic needs in a sustainable way.

- **Women's empowerment is essential for gender mainstreaming.** Gender strategies may focus on women or men separately, or on women and men together, depending on the context and approach. Considering the subordinate position of women in male dominated societies, women-specific initiatives create an empowering space for women and provide the platform for ideas and strategies that can later be transformed into mainstream interventions. Patriarchal attitudes and initial resistance from men to women taking on new roles in water and energy activities can shift once the benefits to the community, households, and to women themselves are clearly explained and demonstrated through gender sensitisation.
- **Gender analysis can lead to success in implementing projects.** Gender analysis is essential if water- and energy-related technological interventions are to receive the priority they deserve. Such interventions must address women's practical, productive, and strategic needs and their multiple roles (reproductive, productive, and their participation in the community). They must also assess how women and men benefit differently from these technologies in order to make visible the varied/invisible roles women, men, girls, and boys play in the family and in the community for the purpose of designing proper policy interventions. Gender analysis tools must be internalised if gender issues in water and energy planning are to be mainstreamed. Unfortunately, the gender tools developed 15 years ago for other sectors are not appropriate nor sufficient for internalising gender awareness in water and energy planning.
- **Making training accessible and suitable for women is important for their empowerment.** Training should be more accessible to rural women, given the time and mobility constraints they face, and their high levels of illiteracy. Training courses can be made shorter with provisions for follow-up training, giving training locally, and setting practical criteria for selecting trainees. The training of prospective women trainers (e.g., the 'training of trainers' approach) is an effective way of training other women both

² 'Water and Energy-precious Resources'. In, *VISIONS of Sustainability*, Issue II, 2004, available online at <www.wisions.net> .

within and beyond project sites. Exposure visits are an effective tool for breaking down barriers to promoting women's awareness and adoption of technologies. The concept of a technology demonstration village can go a long way in facilitating the transfer of technology and the dissemination of information in inaccessible mountain regions.

- **A more permanent solution to the water scarcity problem is possible.** The Women and Energy Project has come up with some promising examples. Some of them include harvesting rainwater on mountain slopes with micro reservoirs in Uttaranchal, planting trees, and social fencing, as a solution to recharging traditional water springs.
- **Supporting the organisational capacity building of women is fundamental to their empowerment.** Meeting practical water and energy needs may free up women's time and allow them to engage in income generating activities, but this alone does little to change their subordinate position unless an enabling environment is created from the top, and women are mobilised at the bottom to confront complex existing power relations. More capacity building efforts using a holistic rather than project-based approach are needed to bring about the desired impact on women's strategic needs and to integrate women in the decision-making at different levels.

Linking project impacts to the MDGs

Policies focusing on women's needs and roles in water and energy can make a difference in meeting development challenges, including the local application of a number of MDG targets, because of their 'multiplier effect' on the lives of women, their families, and the local communities. This is illustrated below.

The impact of water and energy policies must be seen as cross-cutting sectors, warranting links to other policies within the economy.

Table 1 (next page) illustrates how the impacts of the project at the micro level can be linked to the MDG targets. There are both direct and indirect links between women-centric energy and water interventions and MDG-based indicators of development. These interventions can enhance access to income generating opportunities and education by freeing up the time that women and children (especially girls) would otherwise spend on basic survival activities (such as gathering firewood, fetching water, cooking, among others). Other benefits include improved health through the reduction of indoor and outdoor air pollution and associated respiratory infections, less incidence of water-borne diseases, as well as widening women's options for improving their lives and that of their families.

More specifically, Goal 1 of the MDGs – halving poverty by 2015 – will be difficult to achieve without adequate and reliable water and energy services, which are essential to reducing time poverty and drudgery, to increasing productive income, and creating employment opportunities. Goal 2, ensuring universal primary education, will not be possible without first tackling time poverty associated with survival activities, which is a root cause of child labour and one of the ways that intergenerational poverty is perpetuated. Goal 3, gender equality and the empowerment of women, will not be attained without integrating the roles and needs of women into public decision making, implementation, and management – especially in the water and energy sector as an entry point for gender mainstreaming. Improving health and reducing child and maternal mortality rates (Goals 4 and 5) cannot be achieved without dealing with indoor air pollution and water-borne diseases resulting from traditional, smoky cooking stoves and unsafe drinking water. Environmental sustainability (Goal 7) cannot happen without sustainable access to clean energy and water, and so on.



Elizabeth Khaka

Woman standing beside a newly constructed water harvesting tank with funding from UNEP/ICIMOD

Table 1: Linking project impacts at the micro level to the MDGs and targets

Goal	Target	Linking Project Impacts to the MDGs
Goal 1: Eradicate extreme poverty and hunger	Target 1: Reduce by half the number of people living on less than a dollar a day Target 2: Reduce by half the number of people who suffer from hunger	<ul style="list-style-type: none"> • After adoption of water and energy related technologies women are able to save time spent on collecting water and fuelwood. The time saved is utilised for income generating activities to increase income and improve family well-being. • Use of new technologies improves farm productivity, diversifies rural income, and improves household income and nutrition of family members.
Goal 2: Achieve universal primary education	Target 3: Ensure that all boys and girls complete a full course of primary schooling	<ul style="list-style-type: none"> • Access to efficient fuels and technologies frees up children's time, especially girls who are unable to attend school since they are needed to help with fetching wood, collecting water, and other domestic chores. • Income generated through the use of improved water and energy technologies is used for children's education and well-being • Solar lanterns permit children to study at night in less smoky environments.
Goal 3: Promote gender equality and empower women	Target 4: Eliminate gender disparity in education	<ul style="list-style-type: none"> • A decentralised water and energy system reduces the time needed and the burden of fetching water and fuelwood, thereby enabling women and girls to use the time saved on education (adult literacy and schooling) and other income earning activities. • Solar lanterns permit women to use time productively even at night. • Women's individual and collective organisational capacity enhance their self esteem and self confidence, allowing them to address their strategic needs (social empowerment), which has in turn strengthened women's decision-making role at the household and community levels. • Being able to mobilise financial resources enables women to participate in community development activities.
Goal 4: Reduce child mortality	Target 5: Reduce by two-thirds the mortality rate among children under five	<ul style="list-style-type: none"> • Reduction of indoor air pollution and water-borne diseases through the use of smokeless cooking stoves and clean water reduces exposure to diseases and improves child health. • Women have more time for child care as they spend less time on water and energy activities. • Education helps to increase awareness of health, hygiene, and sanitation issues.
Goal 5: Improve maternal health	Target 6: Reduce by three-quarters the maternal mortality ratio	<ul style="list-style-type: none"> • Reduction of excessive workload and the drudgery associated with carrying heavy loads of fuelwood and water has positive implications for women's health. • Minimising arduous and repetitive food processing tasks and cooking in a less smoky environments improves women's health and well-being. • Empowerment and increased incomes enhance awareness about and access to health facilities
Goal 6: Combat HIV /AIDS, malaria and other diseases	Target 7: Halt HIV/AIDS, malaria and other diseases by 2015 and begin to reverse the spread of HIV/AIDS	<ul style="list-style-type: none"> • Awareness raising and social mobilisation as integral components of the participatory action research project spread important public health information to combat diseases
Goal 7: Ensure environmental sustainability	Target 9: Reverse loss of environmental resources Target 10: Reduce by half the number of people without sustainable access to safe drinking water	<ul style="list-style-type: none"> • Rainwater harvesting through micro reservoirs recharges traditional water springs. • Plantation ensures slope stability and retards soil erosion. • Adoption of social fencing by women to control livestock grazing allows healthy growth of trees and ground cover and promotes carbon sequestration and other environmental services. • Availability of cleaner fuels and energy-efficient technologies reduces demand for fuelwood, increases availability of dung and agricultural wastes for fertiliser, and reduces air pollution and greenhouse gas emissions.

Despite the many impacts of women-centric water and energy interventions on a number of MDG targets, policy makers and planners in the region continue to treat energy and water related interventions as gender neutral. Households are often taken as homogeneous units without any recognition that women and men have very different roles and areas of decision making within households. The importance of bringing a gender perspective to energy and water policy analyses and design is still not widely understood and consequently is not fully integrated into mainstream energy and water development activities in the region. Five years into the new millennium, the United Nations reviewed progress on the MDG Agenda at a Special Summit Session of the General Assembly in September 2005. It is yet to become clear how this summit will re-energise the work to place gender-sensitive water and energy interventions at the centre of national poverty alleviation strategies, including the MDGs.

Conclusions and policy implications

For water and energy to become an instrument for poverty alleviation and sustainable development, a drastic change in the existing approach is required. A fundamental readjustment of public policies is needed which will focus on integrating women's roles and needs in decision-making in decentralised, renewable, clean, and efficient energy and water systems. This requires sustained efforts in awareness raising and capacity building. Work must be directed towards policy change, technology innovation, and investments – all supported by a sound analysis of the policy options available. Both international political commitments and partnerships among governments, the private sector, non-government organisations, and community groups are required. There is an urgent need to develop a holistic, rather than a project-based approach to the provision of water and energy, one that is not only technology-oriented but is about understanding the roles that water and energy play in people's lives, especially in the lives of women who are the collectors, users, and managers of these resources.

A further issue is that the use of metabolic energy for tasks related to daily survival is rarely measured and is not reflected in national statistics, making it difficult to understand the whole issue. A full picture of the energy needs of the region is crucial if policy interventions are to be useful.

In addition, policy must be understood as a process, which is as important as outcome (such as state policy legislation, laws, plan). The participatory process of anchoring good practice in national programmes through a bottom-up approach is powerful, a demand-driven way of ensuring that the voice and choice of the people are ultimately reflected in the policy programme and action continuum.

Gender mainstreaming must be carried out in a manner that is empowering for women. Mainstreaming may not work because women may not be in a position to participate on an equal basis with men because of their heavy workload at home, poor access to finances, low literacy, entrenched gender taboos and so on. Women-only projects focusing on empowering them can be a sure way to enhance their capabilities, create opportunities for them, and ensure their participation on an equal basis with men. To be empowered, women must not only have equal capabilities and access to resources and opportunities, they must also have the institutions to exercise those rights, capabilities, and opportunities to make strategic choices and decisions. Since gender inequality is deeply rooted in entrenched beliefs, sociocultural norms, and market forces, it is both a technical and a political process which requires substantial shifts in organisational cultures and mindsets. The goals and structures of projects and positive discrimination in resource allocation must also be addressed.

- Place women's needs and concerns in energy and water interventions at the centre of the national poverty reduction strategy.
- Promote technologies to address women's practical, productive, and strategic needs.
- Offer a bundle of services that are needs-based and which enable women to access improved energy and water to enhance their entrepreneurial and technical skills and self-confidence.
- Establish gender-disaggregated data at all levels using gender analyses tools to understand gender-based needs, constraints to participation, ability to participate, and different benefits of participation.
- Enable institutional representation of women in decision making.
- Support capacity building and partnerships of women and men involved in energy and water management.
- Promote partnerships among government and non-government organisations and in the private sector.
- Anchor demonstrated good practices in the national programme through a bottom-up approach, starting at the local level.

Saving Global Carbon to Benefit Local Communities in the Himalaya

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Forests, soil, oceans, and the atmosphere store carbon. Forests act as carbon sources or sinks at different times. Carbon sources release more carbon than they absorb, while sinks soak up more carbon than they emit. The concept of 'carbon sinks' is based on the natural ability of trees, plants, and soil to soak up and temporarily store carbon dioxide.

The Third UN Conference of Parties (COP 3) on Climate Change held in Japan in 1997 was a landmark event in successfully negotiating the Kyoto Protocol (KP). The Protocol sets a limit on emissions of greenhouse gases and defined reduction objectives for industrialised countries, also known as 'Annex 1 countries'. The KP has set binding targets for industrialised countries to reduce their emissions by an average of 5% below 1990 levels in the period 2008-2012, known as the 'first commitment period'. The Kyoto Protocol came into force on February 16, 2005, after Russia's critical decision to ratify it.

The Protocol has designed three market-based 'flexible mechanisms' to decrease the cost of meeting these reduction commitments: emissions trading (ET), joint implementation (JI), and the clean development mechanism (CDM). While different in operation, the three mechanisms are based on the same principle: that industrialised countries are allowed to reduce emissions wherever in the world those reductions are cheapest, and then count those reductions towards their national target. JI and CDM are called 'project-based' mechanisms because they fund actual projects. JI generally funds projects in Eastern Europe and the former Soviet Union, while CDM projects can only happen in developing countries which do not have an emissions reduction target under the Kyoto Protocol.

Although CDM provides flexibility for developed countries to gain credits from financing emissions reduction projects in countries without emission targets (Article 12), in the context of forests the carbon sink projects under CDM are currently restricted to afforestation and reforestation activities (Marrakech Accord). Community forests are not presently included under the Kyoto Protocol.

How is the carbon market emerging?

Of the three flexible mechanisms of emissions reduction, the provision for carbon trading through CDM and JI mechanisms has led to the development of a global carbon market. The rationale behind emissions trading is to ensure that emissions reductions take place in the most cost-effective manner possible to combat greenhouse gases and therefore prevent climate change. The market created by emissions trading is known as the 'carbon market' as all greenhouse gases are traded at the equivalent of the carbon dioxide tonne (tCO₂e). The carbon market functions as a stock market where the price of carbon emission reduction units (CRUs) largely depends on demand and supply. Market intermediaries quote prices for carbon reduction units offered or bid for. The carbon market is emerging as a key instrument in the drive to reduce greenhouse gas emissions, which have the same effect wherever they are emitted.

The carbon market is emerging as a key instrument in the drive to reduce greenhouse gas emissions.

A recent World Bank study shows a steady growth in the carbon market globally. In 2004, a total of 107 million metric tonnes of carbon dioxide equivalents (tCO₂e) were exchanged through projects, a 38% increase compared to the volumes traded in 2003 (at 78 million tCO₂e). The report mentions that the total amount exchanged on all the allowance markets from January 2004 to March 2005 was about 56 million tCO₂e. This is mostly driven by the ratification of the Kyoto Protocol and the start of the EU-Emission Trading Scheme (EU-ETS). Volumes traded from January to March 2005 are already 3.5 times higher as the total volumes of European Union allowances exchanged in the whole of 2004. India, Brazil, and Chile lead in supplying emissions reductions.

Certified emission reductions is now purchased at a weighted average price of \$5.22/tCO₂e. The report also mentions an increase in the number of buyers of emission reductions.

How does the CDM promote the common global good?

CDM is the only part of the Kyoto Protocol which directly involves developing countries in reducing greenhouse gas emissions. CDM is different in that the emission reduction credits generated by CDM projects before the period 2008-2012 can be counted as reductions in that five-year period. In addition, CDM has an explicit mandate to promote sustainable development, unlike joint implementation or emissions trading. CDM is also mandated to assist developing countries in achieving sustainable development while helping Annex 1 countries to achieve their targets.

In general, CDM works as follows: an investor or a government from an industrialised country can invest in or provide finance for a project in a developing country that reduces greenhouse gas emissions at a lower cost than in the investor's home country. The investor then gets credits called 'carbon credits' for the reductions and can use those credits to help meet the Kyoto target. If CDM works perfectly it will produce three results: first, the investor gets credits that help meet the reduction target; second, the project executing party from the developing country also achieves some project goals including emissions reductions or saving carbon from release into atmosphere; and third, the project itself helps to promote the global common good through its contribution to a cleaner environment.

For example, a Dutch company needs to reduce its emissions as part of its contribution to meeting The Netherlands' emissions reduction target under the Kyoto Protocol. Instead of reducing emissions from its own activities in The Netherlands, the company provides funding for the construction of new biogas plants in Nepal that would not have been able to go ahead without this investment. This, it is argued, prevents or displaces some quantity of fossil fuel consumption in Nepal, leading to a reduction in its greenhouse gas emissions. The Dutch investor gets credit for those reductions and can use them to help meet their reduction target in The Netherlands.

Forest is defined as a minimum area of land 0.05 ha to 1 ha in area with tree cover of more than 10 % to 30% with trees that have the potential to reach a minimum height of 2 m to 5 m at maturity.

Reforestation is direct human-induced conversion of non-forested land to forested land through planting, seeding, and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. Only those lands that did not contain forest prior to 31 December 1989 qualify.

Aforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding, and/or the human-induced promotion of natural seed sources.

Besides the two parties involved in the project, the reduced emissions may be counted as a contribution to improving the global environment.

The actual pattern of CDM investment and crediting is more complex than the example above portrays, and commonly involves intermediaries such as the World Bank or other carbon credit procurement agencies investing money on behalf of industrialised country governments and corporations. Frequently, there is more than one possible scenario for what would happen, which makes the process difficult. In other cases, developers are self-financing CDM projects and then seeking a buyer for the emissions reductions. But the fundamental premise remains the same: industrialised country governments and companies provide the finances to make possible a project that results in reduced emissions that would not have happened otherwise. The credits for reducing those emissions is claimed by the industrialised country investor and can be used to meet their own reduction target.

What types of project are eligible for CDM?

In principle, CDM finances project activities that fulfill the dual purpose of emissions reduction and sustainable development. Projects that aim to sequester or sink atmospheric carbon are also eligible. Switching from fossil fuel-run technologies to clean energy technologies based mainly on hydropower, solar energy, or wind power are options. For example, a cement factory can earn carbon credits by replacing its coal-fired heating system with hydroelectricity. Similarly, a number of diesel-run agro-processing mills may be run on micro hydropower and thus a project aiming to build a micro hydro can be a CDM project.

The criteria for CDM funding for larger-scale projects are stricter than those of smaller-scale ones. Given the flexible provisions for small-scale

project activities, project developers in the Himalaya can reap benefits from the following types of projects:

- renewable energy projects with a capacity of less than 15 MW,
- energy efficiency projects that reduce consumption by the equivalent of 15 GWh/year,
- projects that reduce emissions and emit less than 15 kilo tonnes of CO₂/year, and
- projects to grow trees on bare land.

Weak aspects of CDM policy

Although, in principle, the policy on CDM aims to promote sustainable development through eligible projects, in practice some serious shortcomings of the policy do not help benefiting communities of the developing world despite their contribution to achieving the goals of the Kyoto Protocol. The millions of communities involved in managing their neighbouring forests are an example of discrepancies in the policy, as their contribution to saving additional carbon and avoiding deforestation have not been recognised.

Creating an enabling environment in which developing countries can reap the benefits from the carbon market is a challenge in the heart of which lies renegotiating a policy that would help developing countries access the international carbon market for their products with proper value addition. Particularly, this means counting their contribution to conserving forests in their natural forms.

In a number of developing countries successful community forestry management programmes are in place. The community forests in these countries have successfully increased biomass fuel supplies to cities and towns, helping to reduce poverty and enhance livelihoods, and involving local people. Their programmes are participatory, often with a high participation rate for women, and work towards the empowerment of rural people. Despite the various benefits of community forests, the carbon sink function of these forests and other local beneficial climate impacts are yet to be recognised. The argument is that since community forestry can save global carbon and generate local beneficial impacts in principle, money should be available from international climate sources.

Deforestation avoidance

Tropical deforestation is the single largest source of CO₂ emission, yet the Kyoto Protocol does not cover deforestation avoidance, which has the potential to enhance conservation efforts, sequester atmospheric carbon, and conserve terrestrial carbon stocks. Projects may be designed to meet the high standards of atmospheric, environmental, and social benefits and generate tradable credits in markets other than Kyoto. During COP9, Brazil, the world's largest forest-rich country, proposed the compensated reduction of deforestation. According to the proposal, average annual deforestation is to be based on satellite imagery of the 1980s. Countries that are able to reduce deforestation below the baselines during a commit-



Bhaskar Karki

*Bhojpatra forest
in Manang,
Nepal*

Establishment of a baseline and demonstration of additionality

The baseline refers to a 'without project' scenario. Carbon stock changes over time have to be compared to the baseline. It is necessary to demonstrate that changes in the carbon stock can be made only with additional funds and that the activity enhances the community's long-term sustainable development goals. So long as it can be demonstrated that vast areas of wastelands or non-forest lands can be afforested/reforested, additional criteria will not be a problem.

Addressing the permanence of carbon stocks

It is also necessary to demonstrate that the activity will lead to permanent carbon stock as opposed to depletable carbon stock. For instance, if the afforestation or reforestation activity is focused on the plantation of species likely to be harvested for timber production, this threatens permanent carbon stock. Species that are likely to remain as carbon stocks for many years are more eligible, e.g., local species selected by the communities.

Compatibility of the project with sustainable development criteria

Demonstrating that a clean development mechanism project will lead to sustainable development is not easy because of the lack of agreement on the meaning of 'sustainable development' itself. The criteria are left to national decision makers. But measures such as biodiversity conservation, meeting biomass needs, improved hydrological flows, enhanced income and employment, and so on could offer some criteria.

Addressing leakage

Leakage is defined the net change in anthropogenic emissions by sources of greenhouses gases and removed by sinks which occur outside the project boundary, but which is measurable and attributable to the clean development activity. Leakage is therefore failure to capture greenhouse gas changes outside the accounting system that results from mitigation activities within the system.

ment period are authorised to issue a 'carbon certificate'. Countries must also agree not to increase deforestation in subsequent commitment periods. The International Panel for Climate Change (IPCC) proposed the establishment of a baseline and equivalence between deforestation and carbon stocks. It is argued that deforestation avoidance can better minimise leakages and can offer more permanence than temporary credits and would help protected areas in developing countries to provide incentives for conservation.

Need for affirmative action for policy renegotiation

Although influencing global policy in favour of poor communities requires extra effort, several initiatives are in progress. One of them is the 'Think Global, Act Local Project' – an action research initiative to bring community forestry under the regime of the Kyoto Protocol. This is being undertaken by The Netherlands-based University of Twente in cooperation with partners in seven developing countries, including ICIMOD. The initiative aims to resolve the core constraints to bringing community forestry into the Kyoto Protocol through research, capacity building, the application of technological innovations, and advocacy. Constraints identified for making community forestry

projects eligible for CDM include non-permanence, additionality, leakage, other uncertainties, as well as socioeconomic and environmental impacts.

Studies show that specific management practices adopted in community forestry can help to maintain or increase existing carbon stocks, prevent carbon emissions from biomass and soils, and produce net carbon uptake from the atmosphere into biomass and soil. As a positive gesture, the World Bank has taken an initiative through the BioCarbon Fund to promote forestry CDM projects with the aim of conserving biodiversity, combating desertification, alleviating poverty, and improving sustainable livelihoods. Although this is not aimed at recognising community forestry, the Bank's experiences will be valuable in tackling some of the uncertainties in bringing forestry sector projects into mainstream project activities under Kyoto.

Without doubt, the Kyoto Protocol is the first international treaty of its kind negotiated based on principles of equity and sharing the liabilities for improving the global environment. Efforts to identify gaps and propose corrective measures to improve and refine the Protocol would not only broaden its ability to address a number of global concerns, it would also contribute to the global common good.

The Kyoto Protocol is the first international treaty negotiated on principles of equity and sharing the liabilities for improving the global environment.

Community-managed, Low-cost Ropeways

Learning from the Experience of Uttarakhand

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One of the major constraints to economic development in mountainous areas such as Uttarakhand in India is the challenge of accessibility. Out of thirteen districts in this state, ten are wholly mountainous, and one is partially mountainous, while only two are located entirely in the plains.

Although a good network of roads exists in these mountainous districts, a large number of river valleys, watersheds, and sub-watersheds are away from main tarmac roads. It is estimated that of approximately 15,000 villages, barely 20% to 25% are linked to all-weather roads. The construction of roads in the mountains, although much in demand, poses considerable environmental and financial challenges.

However, it is necessary to link 'pockets' of settlements with the nearest all-weather roads if markets are to be accessed, agricultural production diversified, and the economic development of mountain areas achieved. Since linking to roads is not always possible, an alternative, more cost-effective and ecologically suitable technology is required. Community-managed ropeways are an appropriate transportation technology for the mountain areas of the greater Himalayan region.

The Government of India began an innovative scheme, the 'Integrated Development of Horticulture in Tribal/Hilly Areas', in Almora District in the Central Himalayan State of Uttarakhand in 2000. The project area is rich in forests and lies within an altitude of 300 metres to 3500 metres above sea level. The total geographical area of Uttarakhand is 53,483 sq km, of which 65% is forest and less than 20% is used for agriculture. The feasibility study, 'Integrated Horticulture Development Project' (IDHP) conducted in 2000, stressed the need to link hamlets and compact areas situated in hinterlands with no access to roads. The study indicated that the communities in remote areas have not adapted diversification from traditional low-yielding agricultural crops to vegetables and fruits because of the problem of transporting perishable horticultural produce from villages to the main road. It recommended that the transport problem be resolved by focusing on a system that uses simple technology, which could easily be operated by the communities

themselves and was not dependent on external assistance for routine operation and maintenance. It was decided to experiment with low-cost ropeways to transport materials and agricultural produce not human beings

Thus, the concept of low-cost, community-managed material ropeways, under the alternative marketing system component of IDHP was proposed. But it was found that no appropriate agency was available in the state to install such low-cost, user-friendly units. To overcome this constraint, the project identified 'barefoot technicians' from the adjoining state of Himachal Pradesh. Although material ropeways were used in Himachal to transport fruits from orchards and timber from high altitude forest areas, this was done by contractors only on a seasonal basis. Once the season was over the unit was relocated to another site. It was observed that the

Community-managed ropeways are an appropriate transportation technology for mountain areas.

mobile system used by the barefoot technicians was crude and had limited or no safety measures. Accordingly, the IDHP team in consultation with technicians, made modifications to the system taking into account safety. Erecting material ropeways was carried out using steel girders, replacing the wooden loafs used on more basic mobile units.

Horticulture gives a higher economic return per unit area than traditional crops and is effective for poverty alleviation, especially of economically-disadvantaged farmers. When villagers of the hinterlands situated either on hilltops or in the valleys far away from roads initiated horticultural activities, the excessive cost of transportation made them reluctant to move into high-yielding horticultural cash crops.

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The high cost of building roads and the difficulty of getting the necessary permission to fell trees for the purpose makes road construction an uphill task. Felling trees on mountain slopes can also lead to serious environmental problems. Introducing low-cost, self-sustaining ropeways is a viable alternative. These low-cost, community-managed material ropeways used is a viable alternative for for transporting horticultural produce of marginalised hill farmers and reduces the daily drudgery of carrying heavy back loads up and down steep mountainous slopes. It facilitates bulk transportation, and since the produce reach the markets quickly, their quality is preserved and transport costs remain low.

So far, 17.7 km of rope distance has been erected with 29 spans, both gravity and diesel engine operated, to cover 2850 farmer families. This is equal to a road distance of approximately 40 km. The approximate time of 23 hours on foot has been reduced to 2 hours and 20 minutes by ropeway. The intervention has saved forests, since the construction of one km of road requires felling one ha of forest. Taking into account the carbon being sequestered by these forests, which is observed as 3-4 t/ha/yr in Uttaranchal, the construction of ropeways has contributed significantly to carbon savings and could be considered for the Clean Development

Mechanism projects. The material ropeways constructed were handed over to the farmers for their operation and maintenance using their own resources.

The project attempts to establish both gravity and diesel engine operated ropeways in accordance with site conditions. The ropeways are based on a bi-cable system with a payload capacity of 100 kg. While the gravity ropeways are mainly used to take materials downhill using gravitational force, diesel engine operated ropeways are required to take the materials from villages in the valleys to road heads located on hilltops. Accordingly, gravity ropeways

Ropeways allow farmers to access distant markets for cash crops which have a higher economic return than traditional crops.

have been installed in project villages situated on hilltops while diesel engine operated ropeways are for villages situated in the valleys with hilltop roads.

Costs incurred differ from site to site depending upon the cartage, the length of the ropeway span, as well as type of ropeway. On average, a one km span of ropeway costs IRs 2.5 lakhs for a gravity ropeway, and IRs 3 lakhs (about US\$ 7000) for a diesel engine operated ropeway. The project required a cash and/or labour contribution from the communities,

Case 1: Diesel engine operated ropeway

Shama Dana Village (Bageshwar District)

Commenced on:	April 2003
Length:	1300 m approximately
Village location:	Hilly slopes, 2.5 km below the road head
Items transported:	Vegetables, fertilisers/compost, plants, construction materials, grains etc.
Quantity transported:	1266 quintal (2003); 1608 quintal (2004); 471 quintal (to June 2005); total: 3345 quintals
Families benefiting:	All 37 families of Shama Dana Village (18 of the families living below the poverty line)

Operation/maintenance mechanism (O & M)

Secretary of the village farmers' interest group (FIG) is responsible for O&M of ropeway for which the Secretary charges IRs 2 of every IRs 7 for transportation of goods of a load of 50 kg

Benefits as experienced by the villagers

- Prior to the installation of the ropeway, transport cost for 50 kg was IRs. 15. With the ropeway the cost has decreased by 50% to only IRs 7 (paid to FIG).
- Time is also saved, as villagers need not travel to take their produce to the market (more than an hour away). Farmers have used the time saved to tend their fields and enhance production. With the ropeway it takes only 5 minutes for the produce to reach the main road.
- Now perishable vegetables are transported to market on time.
- Villagers prefer to write notes to shopkeepers at the road head to convey messages (and vice versa) and have thus saved the time it takes to travel uphill on the road for 2.5 km.

Difficulties in operation

- One operator at both ends is necessary to operate the ropeway.
- Diesel has to be procured regularly.

Case 2: Gravity operated ropeway

Gyandhura Village (Bageshwar District)

Commenced:	May 2003
Length:	800 m approx
Village location:	Hilltop
Items transported:	Vegetables, construction materials, grains
Quantity transported:	1243 quintal (2003); 701 quintal (2004); 138 quintal (to June 2005); total 2082 quintal
Families benefiting:	All the 23 families of Shama Dana Village (including 17 families living below the poverty line)

Operation/maintenance mechanism: The community has appointed two technicians for O&M who collect IRs 2 out of each IRs 5 charged for transportation of a 50 kg load.

Benefits as experienced by the villagers: Prior to the ropeway, manual transportation of 50 kg from the village to the road head cost IRs. 10 which has reduced to IRs. 5.

- Travel time to road head carrying 50 kg took one hour, now it takes only 2 minutes.
- Reduced drudgery and travel time after installation of the ropeway has encouraged increased production of vegetables, floriculture, and other crops.

Difficulties in the operation:

- Bulk transportation of goods to village from lower terminal not very feasible.
- Some marginalised farmers prefer to carry their produce themselves to save money.

depending upon the cost of the ropeway, to ensure that the communities felt ownership of the infrastructure created. Civil construction was minimised to keep costs low. Expenditures included the construction of a small tin shed and a platform to protect and operate the system.

The ropeways have received mixed responses from the village communities. Some of the villages (Shama Dana in Kapkot Block, Bageshwar District: Case 1) are using the device extensively and have succeeded in establishing an operation and maintenance system. The villagers have found a sustainable answer to the problem of taking horticultural produce to the road head through a narrow 2.5 km uphill bridle path. The project has also assisted the construction of a storage and collection centre at the road head. In Dhaura Village (Lamgarah Block, Almora District) villagers made negligible use of the four spans of installed ropeway. The project is investigating other cases to develop a code of conduct for establishing low-cost, community-managed ropeways in the state.

The ropeways are envisaged to be used to transport horticultural produce from villages to road heads. Villagers have started using them for other purposes as well, such as for carrying the public distribution system's ration and construction materials for transporting water, taking compost to the fields, transporting planting materials in bulk, and so on.

Lessons learned

The experiences gained in Uttaranchal clearly indicate that low-cost ropeways are an effective intervention to promote the economic development of hinterland villages in mountain areas not accessible by road. Some important specific lessons are as follows.

- The availability or potential of exportable items such as horticultural or other produce from the villages needs to be properly assessed.
- Two-way transportation is better, i.e., if villages are also importing large amounts of goods.
- If villages are located in the valley and have to access a road head located on a hilltop, the gravity ropeway will be economically feasible if villages have exportable items such as vegetables or fruits.
- There has to be clear community ownership of the land that serves as landing site right from project design.
- If the time saved is not significant, villagers prefer to carry the load themselves rather than go to the unit to operate it. A ropeway span of more than 750 m contributes significant savings in both time and labour.
- Capacity building of the local communities to ensure full operation and maintenance must be part of the project. Safety aspects need to be built in the training package.

Villagers have started using the ropeways to carry construction materials and water, and to take compost to the fields.

Enhancing Market Access and Livelihood Options in the Himalayan Region through Gravity Ropeways

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Improving roads and bridges along steep, fragile, and rough terrain across scattered settlements is a major development challenge for governments across the Himalayan region. Access to markets for many mountain products and resources is severely limited, as is the delivery of development inputs and services to mountain communities.

Poor accessibility in mountain areas also means marketable services and niche resources remain grossly underutilised and undervalued. In remote parts of the greater Himalayan region, human porters, mules, goats, and yaks continue to be the principal means of transport. Not only is the human drudgery associated with transporting loads on people backs high, the long travel time and the low volume of freight that people and animals can transport make marketing mountain products and natural resources uneconomical. Unless per unit transport cost can be reduced and trade flows – primarily exports – are increased, mountain areas are unlikely to benefit fairly from trade. Globalisation and trade are likely to further accentuate the already unfavorable terms of trade and marginalise mountain people in the very environment and with regard to the very products which should give them comparative advantage. Poor physical accessibility will continue to be the single main obstacle to harnessing the comparative advantages of mountain areas. Although low-cost, labour-intensive roads have been designed to reduce construction costs, roads in mountain areas cannot fully cover the

scattered settlements. Investments in roads in mountain areas are also difficult to justify environmentally. Topography makes even the shortest trip time-consuming, as road and path systems hug contours and wind slowly up and down gradients across hillsides.

Gravity ropeway (GR) technology is a cheap and simple means of transport based on the force of gravity to move goods between two points on a linear path. A heavier load is allowed to slide down at a certain angle; the same force helps to pull a slightly lower weight from the other end (see photo). A flywheel with a bearing and bracket located at the downhill station is used as a brake. The operator at the upper end strikes the wire rope with a stick to send a wave signal to the operator at the lower end. The person at the lower station then applies hand brakes, to control the flywheel.

Since the ropeways traverse straight paths, capital, operation, and maintenance costs on a per km basis are all low. The technology relies entirely on gravity and hence does not require external fuel and

A comparison between GR and other ropeways that require external energy is provided below.

Gravity Ropeways	Other Ropeways
Low-cost technology	Medium- or high-cost technology
Appropriate technology	Modern technology
No external power required	External power (electricity or fuel) required
Local people can manage the system	External expert should be hired
Two operators can operate system	More than two operators are needed to run the system
Low repair and maintenance costs	High repair and maintenance costs
Local operator can replace ropeway parts	External expert required for replacement of parts
Mainly used for short spans (maximum 2.5 km)	Mainly used for longer spans

is non-polluting. It reduces transport time and drudgery and is easy to operate and can be managed and maintained by the mountain communities themselves. The technology is not new

Ropeways are environmentally friendly and require minimal infrastructure at ground level. They are suitable for earthquake and landslide-prone areas.

and has been in operation for a variety of purposes for many years. Ropeways have been used to transport timber, limestone, and farm products.

In partnership with Practical Action Nepal (PAN) (formerly Intermediate Technology Development Group [ITDG]-Nepal), ICIMOD has supported the construction of two pilot gravel ropeways in Mustang district, Nepal. The ropeway has helped reduce women’s travel time and the drudgery associated with it. Using the ropeways, women are now able to transport firewood, fodder, and other natural resources to their villages from the forests. The technology has eased the bulk transport of apples and has allowed these products to be moved quickly to their markets, thereby minimising spoilage. Instead of porters, local people now use the ropeway to carry inputs. After the ropeways’ installation local market prices of imports have gone down by almost 5%. This has helped farmers and traders realise similar increases in their profit margins. The ropeways are managed and operated by a committee of local people.

Economics of gravity ropeways in two hill areas

ICIMOD and PAN have also completed a feasibility study for two gravity ropeways in Nepal. The first is on the feasibility of a gravity ropeway connecting Janagaun village in Dhading district to the roadhead along Prithvi Highway. The second study is on the feasibility of a gravity ropeway to connect Chapakharka village located on the ridgetop above

the ICIMOD Training Demonstration Site at Godavari to the roadhead. Currently, portering is the only means of transportation in both villages.

In Janagaun it takes about three hours to get from the village to the road head carrying a 50 kg load. The current transport cost by porters is about Rs 1.75 per kg. The proposed ropeway (1.35 km) would reduce this time to just 10 minutes. With the ropeway, the minimum transport cost that needs to be charged is Rs 0.18 per trip to meet the full annual operating and maintenance costs as well as the replacement cost; it is financially sustainable. If villagers increase their



A gravity ropeway under construction using local labour and materials



Testing the newly constructed gravity ropeway in Janagaun, Dhading District, Nepal

Mahendra Bijukuchhay

Mahendra Bijukuchhay

Summary results of an economic cost-benefit analysis of gravity ropeways in Janagaun and Chapakharak villages

Scenarios	PRESENT VALUE (NRs)		NPV @ 12% discount rate (NRs/km)	EIRR	BC ratio	Switching Values*	
	Cost	Benefit				% Increase in cost**	% Decrease in benefits**
Base Results							
• Janagaun	1,004,263	3,298,765	2,294,502	55.89%	3.28	228%	-70%
• Godavari#	894,918	1,584,573	689,655	27.35%	1.77	77%	-44%
Sensitivity Results							
Total project cost increase by 20%							
• Jangaun	1,205,116	3,298,765	2,093,649	45.76%	2.74	174%	-63%
• Godavari#	1,073,902	1,584,573	510,671	21.72%	1.48	48%	-32%
Total project benefits decrease by 20%							
• Jangaun	1,004,263	2,639,012	1,634,749	43.73%	2.63	163%	-62%
• Godavari#	894,918	1,267,658	372,740	20.57%	1.42	42%	-29%
Total cost increase and benefits decrease by 20% each							
• Jangaun	1,205,116	2,639,012	1,433,896	35.57%	2.19	119%	-54%
• Godavari#	1,073,902	1,267,658	193,756	15.84%	1.18	18%	-15%

* Switching value to bring EIRR to 12% (i.e., discount rate)

** Negative values imply decrease in cost/benefits

Preliminary result from cost-benefit analysis

marketable surplus of vegetables, fruit, and other products (i.e., producer surplus) the benefits that accrue from ropeways will be even greater. For example, with producer surplus, the economic internal rate of return exceeds 50%.

The cost-benefit ratio of installing a gravity ropeway in Chapakharka is equally encouraging. Without a ropeway, it takes a porter approximately two hours to bring goods into Godavari market from Lattle Bhanjyang (upstation) and one-and-a-half hours going back. Porters currently charge about Rs 65 to carry a 50 kg load. The proposed ropeway (1.35 km) would reduce this time to less than 10 minutes. The minimum transport cost that needs to be charged to make the system financially sustainable is only Rs 0.26 per trip.

The Table above summarises the cost-benefit ratio of gravity ropeways in two sites showing their estimated economic internal rate of return (EIRR), net present value (NPV) per km, and the benefit-cost (BC) ratio along with switching values to understand the

sensitivity of the results under different scenarios. The results indicate that a ropeway at both sites is justifiable on economic grounds with an estimated EIRR many times higher than the cut-off discount rate (12%) and the BC ratio greater than unity.

Conclusions

Gravity ropeways represent an effective and viable mountain technology for enhancing market access and livelihood options, and for reducing drudgery in mountain areas. While the saving in transport costs alone is sufficient to make the system financially viable, the technology should be promoted using an integrated marketshed approach to enhance marketable surplus with complementary investment in production pockets. When marketable surpluses are increased, connecting isolated settlements to roadheads not only further encourages marketable surpluses and contributes to improving livelihoods in the mountain areas, it also adds value to generally underutilised mountain roads.

The huge savings in transportation time and cost makes gravity ropeways economically viable in mountain areas.

Success Stories in Water Harvesting from Bajeeena and Naila Villages, Almora District, Uttarakhand

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Water scarcity is a growing problem for countless mountain communities and causes great hardship to women and girls, who must spend many hours each day collecting water from distant sources. This article focuses on two successful water harvesting projects in Bajeeena and Naila villages of Almora District, Uttarakhand, India.

The Energy and Resources Institute (TERI), with support from UNEP and ICIMOD, implemented a two-year pilot project from April 2002 to September 2004 in the hilly districts of Bajeeena and Naila in Almora, Uttarakhand, and in Kotla and Nager villages in Solan district, Himachal Pradesh, India. The pilot project was based around participatory action research and sought to build the capacity of women's groups and empower them in water and energy management practices. Various water and energy related technologies were implemented based on the prioritised needs of women and community members. The project was implemented in coordination with the local partner organisations, HOPE in Uttarakhand, and DEEP in Himachal. This paper focuses on two successful water harvesting experiments piloted in Bajeeena and Naila villages of Almora district, which have had a positive impact on the livelihoods of the women in these villages.

Recharging traditional water springs is possible: the case of Bajeeena

With a population of 70 households, Bajeeena is a typical hill village situated on both sides of the main road 14 km away from Ranikhet, the nearest town. A 'naula' (traditional water spring) is located in the vicinity of the village. Due to deforestation and the consequent drying up of the water spring, villagers in Bajeeena had been facing an acute shortage in water, especially during the dry season. During summer, the water discharge from the naula decreases considerably and women have to wait long hours to fill their pots from the trickle that comes out of the spring. The discharge was measured in July and was found to be insufficient to meet the villagers' needs. Although many households were connected to

pipled water supplied by the government, the supply came irregularly and was insufficient to meet their needs. The water crisis was reported to have started in the last few years, primarily due to deforestation. Women point out that the plantation of pine trees surrounding the vicinity of the water spring was also to blame for the decreasing water table in the area.

To overcome the problem women's groups in Bajeeena came up with the idea of replanting the barren hill slope above the water source with indigenous trees and other plants. After carrying out a detailed investigation of the area, TERI, in consultation with the women's groups and local NGOs, supported the idea. The women constructed 14 micro reservoirs spread over the barren hill slopes to trap and store rainwater, which would percolate through the slope and recharge the traditional water source. The women also planted 2500 saplings of medicinal and horticultural and fodder and fuel species on 5 ha of the hill slope to ensure slope stability and generate income, and to ensure the availability of firewood and fodder. The women of



A micro reservoir for recharging the traditional spring in Bajeeena, Uttarakhand

Rakesh Prasad

Bajeena also controlled grazing through social fencing. The money that they were able to raise for operation and maintenance was also managed by the women themselves.

After the first monsoon the village spring was discharging more water and the small water tank constructed to store the surplus water was overflowing. The women then decided to construct a larger water storage tank to collect the overflow, even before the pilot project was completed. They took a loan of IRs 40,000 from the bank and contributed labour to construct the storage tank.

The construction of micro reservoirs in Bajeena and an infiltration well in Naila has overcome water scarcity in both these villages.

"We have succeeded in recharging the water spring and God has listened to our collective voice and efforts," says the women's leader in Bajeena. Influenced by this success, the local Panchayat government replicated the practice in the neighbouring villages of Khagyar and Kothiyan.

While the full impact of this innovation is likely to be felt only after several years, available water in Bajeena has already doubled. The Bajeena women indicate that even during the dry season the water discharge is more than in the past. This innovative water harvesting method can go a long way towards addressing water scarcity problems, broadening livelihood options, and can also help improve the environment in many parts of the Himalaya in a sustainable way.

Infiltration well technology: Naila

Naila is a small village located at an altitude of 1500 m and is approximately 10 kms from Ranikhet.



Rakesh Prasad

Infiltration well constructed in Naila, Uttarakhand

It is about one km away from the main road. Water shortages in this village were acute and women found it hard to meet their immediate household water needs. Naulas are the only source of water in this village. Many reasons are cited by the villagers for the water shortage. Some indicate that water sources have either disappeared or water discharge has declined after an earthquake. Others indicate that the heavy plantation of 'chir' pine trees caused a drop in the level of the water table. Women were forced to spend four to five hours a day collecting water from a water source that yielded only a trickle. Available water

of 475 litres per day was much lower than the village's requirement of 3660 litres per day, assuming a per capita daily need of 30 litres. Women sometimes spent the whole night collecting water from the underground spring. This situation was becoming worse over time, and especially during the summer when the women had to spend entire nights waiting in line to fill their vessels. Often there were quarrels among the women over water.

Infiltration well technology was identified as the only feasible option to meet the water requirements of the village. A large underground collection chamber was constructed to collect water. After sealing the chamber, a hand pump was inserted in the tank to pump out water.

A woman contributed land for the construction of this innovative scheme since the water source happened to be located on her property. Naila women collected IRs 200 from each household for the construction of the well, which took a whole month. Now each woman contributes a token amount every month for the well's operation and maintenance. The women have also introduced an innovative way of managing the system. The responsibility for opening and locking the hand pump is rotated every day among members. The pump is opened for two hours in the morning and evening, then locked up with an iron chain to allow the well to recharge. Although water is still relatively scarce in Naila, the infiltration well technology has saved women hours collecting water.

The formation of separate women's groups and their organisational capacity building, gender sensitisation sessions, and community mobilisation have clearly helped the project succeed. Empowering women at the community level has made it possible for them to address and prioritise their water and energy needs.

Women as Energy Entrepreneurs

Successes from a Pilot Project in Phobjikha and Limukha Villages, Bhutan

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With a venture to produce solar dryers and the establishment of an LPG depot in two remote locations, some women in Bhutan are emerging as energy entrepreneurs. These endeavours are taking place through a UNEP/ICIMOD and RSPN partnership project.

An LPG depot in Phobjikha

Phobjikha Valley is the winter home of the protected black-necked crane. The Royal Society for the Protection of Nature (RSPN) is also implementing its Integrated Conservation and Development Programme here. Development interventions in this valley are thoroughly scrutinised to assess their impact on the black-necked cranes and their habitat. The valley remains unconnected to grid electricity from fear that that the high voltage transmission lines may hinder the flight of this rare and endangered species.

Firewood is the main source of energy used by households for cooking and space heating. An increasing number of households have also begun to use LPG for cooking, but its use has not been widespread because of the difficulty in obtaining LPG. LPG cylinders have to be transported from the market centre at Wangdi, half a day's distance away.

Improved cooking stoves (ICS) as demonstrated by the project were not in demand given their incompatibility with the housing structures in Bhutan. The women preferred LPG and sought project help to establish an LPG depot in Phobjikha. The women had several good reasons for selecting this activity. First, it was the most suitable energy option available as it did not have any effect on the conservation efforts being made in the valley, and the use of LPG helps reduce pressure on the forests. Besides saving time and energy in collecting

firewood, establishing a local depot would reduce the time and effort needed to obtain gas cylinders. The saved time could then widen the women's options for productive activities, with the use of LPG also clearing the air in the kitchen environment and promoting health benefits.

The LPG depot in Phobjikha was established after gaining the necessary approval from the Ministry of Trade and Industry, including an order by the Ministry to the LPG distributor from Tashi Commercial Corporation. The capacity of the LPG depot is 340 cylinders, of which the women from the Bjena, Gangtey, and Phobji blocks contributed Nu. 1400/per person to purchase 240 cylinders. An additional 100 cylinders was supported by the project and are kept in reserve to provide refilling facilities for the Phobjikha community. The women's welfare association formed in Phobjikha is responsible for managing the depot. According to their rules, income from the sale of each cylinder is



LPG depot run by the women's group in Phobjikha, Bhutan

Elizabeth Khaka

distributed as follows: a) Nu 3 for the Phobjikha Conservation Area Project community fund b) Nu 10 per cylinder as incentive for the salesperson; and c) Nu 2 per cylinder to cover rent. From the funds generated, the women plan to provide loans to members of the women's group for income generating activities. At present, a treasurer of the women's group is also serving as salesperson. The depot functions twice a week: Mondays and Thursdays (9 am to 1 pm).

The LPG depot in the Phobjikha has reduced the time and effort needed to obtain gas cylinders as well as reduced pressure on the forests in the area. The use of LPG has also promoted health benefits through reduced indoor pollution. Besides fulfilling the women's energy needs, the venture demonstrates how women can become successful energy entrepreneurs.

Solar dryer production in Limukha

A women's group at another project site, Limukha village, selected solar dryers as a safe technology that can be used to dry meat, chillies, and other vegetables in a hygienic manner. Following the

interest women showed in setting up a solar dryer production business, RSPN trained the women to make solar dryers with the help of a skilled carpenter hired for eight days, and provided seed money to produce solar dryers for commercial sale. The women were also supplied with raw materials to make 20 solar dryers. To minimise transport costs, they set up a production outlet in one of the member's houses close to the market (see photo, below).

If women are to be economically empowered, an enterprise-based approach to energy management with the active participation of women in decision making is vital.

The group has already produced nine dryers. While RSPN is planning to help the women market this product through the media and exhibitions, the women of this group have, on their own, decided to do their own market promotion by displaying their solar dryers at vegetable markets and have fixed the price at Nu 3000 per system. Profits made from the sale of the solar dryers will be retained as their community fund, which will be used to provide small loans to members for income generating activities.

These two examples demonstrate how an enterprise-based approach to energy management with the active participation of women in decision making is necessary for their economic empowerment. The advantages of promoting women as energy entrepreneurs include their advancement, the expansion of economic activities and diversification of productive options, and the creation of new sources of wealth and income to support family investments in education and health. The enabling conditions created, particularly the formation of women-only groups, has clearly helped this process. In such groups women have felt comfortable taking charge of the technology instead of handing over control to men and being relegated to passive 'beneficiaries'. Once their level of confidence has been adequately enhanced through the initial women-only initiatives, these leaders and entrepreneurs will, it is believed, continue to provide leadership in their communities.



Elizabeth Khaka

Solar dryer produced by women's group in Limukha, Bhutan

Promoting Technological Interventions Related to Water and Energy Resources

A Case Study from Nepal

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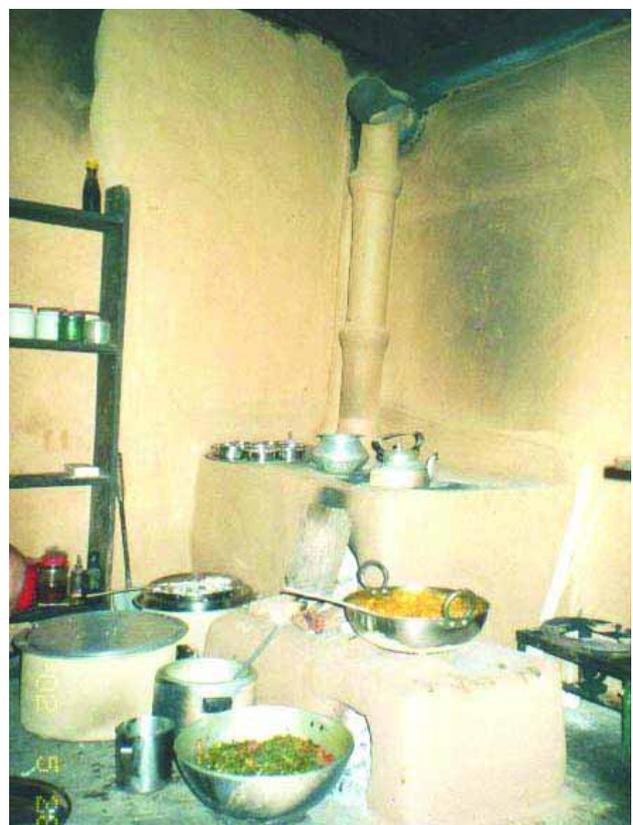
Water and energy are prime resources vital for human survival and well-being. Their scarcity has serious implications for livelihoods. Over the years, poverty, population growth, and the growing demand for firewood and agricultural land to cultivate food have resulted in deforestation and the degradation of natural resources.

In the Himalaya, the scarcity of water and energy has the most serious effect on women. They have to travel away from their homes to meet the water and energy needs of their households. With the increase in work hours and drudgery, opportunities for income generation and other livelihood options are also jeopardised. This perpetuates poverty among women and has been a serious problem in many parts of the Himalaya.

To address this problem and diversify livelihood opportunities for mountain communities, especially women, the Centre for Rural Technology Nepal (CRT/N) with support from ICIMOD/UNEP, implemented a two-year pilot project from April 2002 to September 2004 in two micro-watersheds of Nepal – Palpa and Dhankuta districts in the west and east, respectively. The project was implemented in coordination with local partner organisations, the Nepal Red Cross Society (NRCS) in Palpa and the Society of Local Volunteers Effort, Nepal (SOLVE-Nepal) in Dhankuta.

The project sought to integrate women in decision making, in implementation, and in the management of household energy and water initiatives. This was done by building the women's capacity to organise themselves in order to identify their needs and roles and to implement energy and water related technologies that reduce drudgery and enhance their options for productive employment and socioeconomic advancement. The project focused on both meeting women's immediate practical needs and on enhancing opportunities to meet women's productive and strategic needs. The project followed a participatory 'learning by doing' approach and placed the women in the forefront at

all stages of the project. It focused on utilising the strengths and operational mechanisms of the existing women's groups as an entry point for project intervention. This created an enabling environment for women, who could identify their water and energy needs and implement technologies according to their felt priority. The creation of a district coordination committee at the project level was another distinct feature of the project approach, which later became instrumental in building rapport



A combination of improved cooking stove and water collection technologies make for cleaner kitchen environments

Centre for Rural Technology (CRT), Nepal

and strengthening coordination and linkages with various district-level line agencies supporting the project in different ways.

Impacts

Project interventions through orientation, demonstration, and skills development training in various technologies and in capacity building have led to the introduction of simple, appropriate technologies and have enhanced people's ability to maintain the technologies. Some of the more popular include improved cooking stoves (ICS), drip irrigation, solar dryers, solar plastic houses, rainwater harvesting tanks, and wastewater management systems.

The introduction of these technologies along with support mechanisms such as a revolving fund, group savings, among others, have generated visible impacts on the lives of women. Use of these technologies has reduced their workload and the drudgery involved in collecting water and energy, improved their health and that of their families through reduced indoor air pollution, and wider options for the productive use of saved time for income generating activities.

Almost all women members at the project sites have adopted ICS. Women have also emerged as energy entrepreneurs, producing and marketing the stoves. The immediate impact has been the reduction in indoor air pollution and its associated health

hazards. Many women have installed drip irrigation systems, recognising not only the scarcity of water but also the need to irrigate vegetables. Vermicomposting has increased in farm and vegetable production in the project areas. Women have produced vegetables and other food crops both for sale and home consumption. The beekeeping training provided has resulted in its adoption as a new micro-enterprise, providing a source of income for many women at both project sites.

The project has had a positive impact on the livelihoods of the women and their communities, reducing drudgery and opening up livelihood options.

Women have used their collective strength to establish group nurseries and vegetable collection centres to sell their produce at distant markets. They have also established a village technology centre to demonstrate and enable the speedy transfer of field-tested technologies already adopted by the women in other areas. Linking the women's group with other line agencies has helped them acquire support for capacity building and has also helped generate wider impacts. The community groups in the project have become proactive and have initiated activities on their own such as improving sanitation in their village through the construction of toilets, and regular village clean-up campaigns. They have also initiated adult literacy classes and training in tailoring – activities that were unplanned for in the project.

Within a short implementation period of just two-and-a-half years, the project has had a considerable impact on the livelihoods of the women and their communities in terms of reducing drudgery and opening up livelihood options. The impact has extended from the micro-level to the meso-level in the district. The District Development Committee of Dhankuta is firming up the success of the project and replicating it in Bhetetar Village Development Committee, where the nationally-recognised Village Development Programme (VDP) is currently operating in 62 out of 75 districts of Nepal. This has profound policy implications in terms of integrating the project concept into the development planning process in Nepal.



Elizabeth Kharka

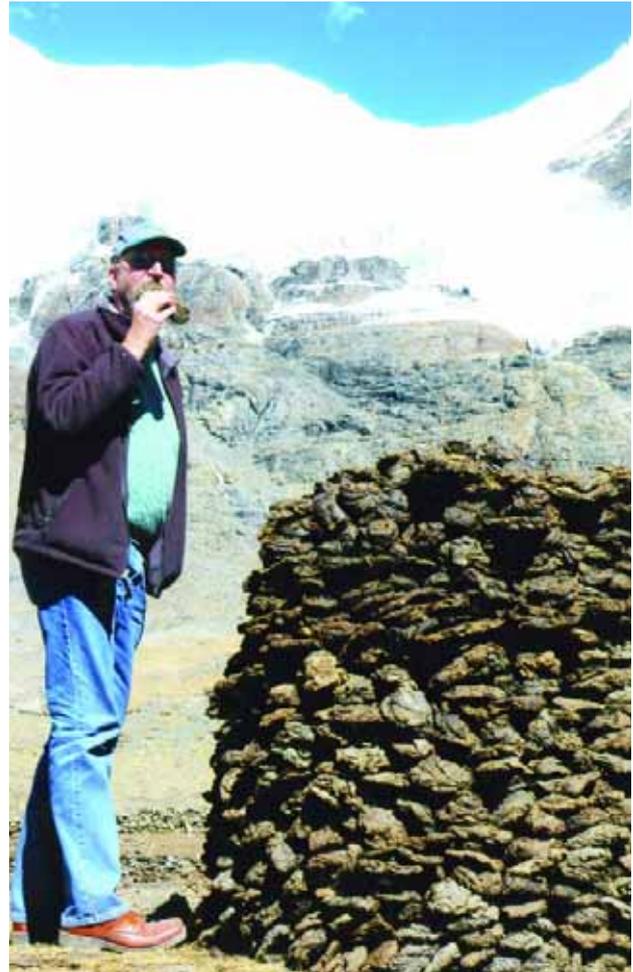
Mud-covered, three-hole metal improved cooking stove in HP, India

Sustainability and replicability

The project has focused on training key local women as trainers in water and energy management along with enterprise development activities. The local trainers have been responsible for an exchange of information among the villages and have started to provide the information required through various technical support services to other villages and communities. Local women now have the skills and confidence to operate the micro-enterprises which have been developed with various market linkages and channels. Business development training for the promotion of their products, such as fresh vegetables, honey, candied fruits, pickles, and dried vegetables has created new income generating opportunities. A vegetable marketing group has also been formed in each project site, activated by the villagers themselves. Accordingly, the marketing committee chairperson hauls surplus vegetables from the members and regularly takes them to distant markets. Coordination and linkages with various line agencies in the district has also contributed to leveraging funds and other support activities. In addition, the line agencies and organisations have taken the project as a platform for integrating their own project activities in the area. CRT/N has also taken the project beneficiaries as the target group for the SARI (South Asia Regional Initiatives for Energy)/Energy Small Grants Programme-supported Solar Dryer Project since December 2004 to ensure continuity of the project's success. Under the SARI/Energy project, a further twelve groups of women have been formed within only six months. Earlier, it took two years to reach these many groups.

Conclusion

Addressing women's development needs, reducing their workload and drudgery, and improving their health, income, and position in society require that a bundle of services and multiple technologies be offered, using an integrated participatory planning approach. This will enable women to access improved energy and water services and enhance their entrepreneurial and technical skills. Awareness development and mobilising the communities and local organisational capacity building should be key components of any project. Through these components project activities can be launched and upscaled. The approach also helps replicate good practices in adjoining villages. Establishing village technology demonstration centres can be an effective model for information dissemination and demonstrating the positive impacts of the project in



Xu Jianchu

ICIMOD Director General J. Gabriel Campbell tests the quality of local energy sources in the Tibet Autonomous Region.

and around the village. The creation of a revolving fund and improved community access to micro-credit are effective mechanisms to help start micro-enterprises in mountain communities whose members have limited financial means to meet their productive needs and to establish group funds. The peer transfer of knowledge and skills on the adoption of technologies and the management of the groups has contributed to more groups being formed in the adjoining areas. Based on its demonstrated success, the project has been selected as an example of good practice by the Wuppertal Institute for Climate, Environment and Energy, Germany. Focusing on women's needs and roles in water and energy can make a big difference in meeting the development challenge of the mountains areas. Policy makers and development practitioners can readily take up these experiences, replicate them, and adapt them to their particular needs and settings.

This paper is based on the experiences of the project 'Incorporating the Needs and Roles of Women in Water and Energy Management Practices in Nepal' (April 2002 - September 2004), supported by ICIMOD/UNEP and implemented by the Centre for Rural Technology, Nepal (CRT/N).

The Carbon Market as an Emerging Livelihood Opportunity for Communities of the Himalaya

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Climate change induced by increased greenhouse emissions is real and has begun to affect us all. Human activities have increased the concentration of carbon dioxide in the atmosphere from 280 parts per million (ppm) to 372 ppm in less than two centuries and global temperatures by 0.6° C in the past century.

Evidence of this global crisis include the rise in global sea levels by 20 cm, which poses a threat to millions living in coastal areas, and the melting of the world's snow packs and glaciers; while in many mountain areas the yield of apples has decreased due to inadequate chilling.

Countries of the world are seeking an international commitment to reduce CO₂ and other greenhouse gas emissions worldwide. The Kyoto Protocol is an attempt to set up an international process to address the problem of increasing CO₂ in the atmosphere. It provides an economic process that puts a value on not emitting CO₂ and enables countries to trade carbon emissions. Carbon trading is a mechanism to pay for an ecosystem service.

Towards a fuller valuation of forests to justify conservation

Seeking positive linkages between conservation and economic growth is an important approach in modern forestry. The approach began with the age-old system of sustainable harvesting of timber, where timber was extracted from forests in amounts equal to annual increments while allowing the capital to remain intact. Later, the focus shifted to include economic activities such as the harvest of non-timber forest products (NTFPs) from forests, with the idea that if money could be generated from NTFPs (such as resins, fibre, and mushrooms), there would be no need to cut down forests.

Recently, forest ecologists have begun to think about generating money from standing forests by valuing ecosystem services and developing payment mechanisms based on these services. The provision of payment for carbon sequestration and other

ecosystem services represents this approach. Carbon sequestration is the process whereby atmospheric carbon is absorbed into carbon sinks such as oceans, forest, and soil. It is cited frequently as an ecosystem service that forests can provide since it can be measured and traded. However, there is a need to

Forests should be able to generate enough money to make people interested in their conservation.

expand the purview of credits and trades by including other ecosystem services of forests such as soil formation, retention of soil and water, and overall hydrological regulation and direct climate effects. A fuller valuation of forests is necessary if forests are to be better conserved by local people.

Over the past decade, progress has been made in developing carbon markets as part of the efforts to implement the United Nations Framework Convention on Climate Change (UNFCCC). The market is still developing, but recent worldwide initiatives suggest that forestry offsets could play an increasingly important role in achieving the emission reduction targets agreed by signatories to the Kyoto Protocol. In addition to the market regulated by UNFCCC, several other developing private markets aim to regulate their environmental impacts, such as emissions of greenhouse gases (GHG). Many companies in the US and Canada are involved in the trade of carbon credits with the ultimate aim of developing a workable market mechanism for carbon. A new market trading centre – the Chicago Climate Exchange – facilitates carbon trading. Through this, companies can exchange (buy and sell) carbon credits. Carbon as a commodity can be traded at national and international levels between US\$ 8-10/tonne without any transportation or quality control.

The Inter-governmental Panel on Climate Change (IPCC) has identified a gap of approximately 800 million tonnes per year between the emission of GHG and the committed reduction by signatory countries to the Protocol. Nearly 25% of the annual atmospheric increase of about 8 billion tonnes of carbon is a consequence of deforestation, which depletes carbon sinks. Therefore, the conservation of forests, including those under the control of local communities in developing countries, is an important component of the overall global climate strategy. Forest sinks represent a cheaper and easier solution to the build-up of atmospheric carbon. However, carbon sequestration by existing forests, including those managed by local communities, is not eligible for carbon trade under the present structure of the Kyoto Protocol.

Uttaranchal's community forests

In the Western Himalaya of India, the state of Uttaranchal (UA) occupies a special place in the participatory management of common resources because of its Van Panchayats (VPs), which represent one of the largest and oldest institutions in India based on collaboration between the state and the community. Introduced in the 1930s and now in operation in more than 12,000 villages occupying nearly 30% of the total forest area of the state, the VPs are governed by a committee almost without any external financial or technical assistance.

Nature of 'Kyoto: Think Global, Act Local'

Under the project, 'Kyoto: Think Global, Act Local' presently underway in several countries of the developing world (including India, Nepal, and East and West Africa), efforts are being made to enable local communities to measure and monitor carbon sequestration in their community forests and to make a claim for payment for carbon services. The project, being coordinated by ICIMOD in Nepal and Uttaranchal, aims to explore the possibility of community forest management systems in carbon saving and capacity building of the local communities to involve them in the carbon trade. This work is being carried out by ICIMOD's partner in Uttaranchal, the Central Himalaya Environment Association (CHEA). Results show that communities can be trained to use technology to measure carbon sequestration rates in their community forests. This approach results in lower

transaction costs as it does not overly rely on experts' time. When payments for carbon sequestered are made, local communities are able to retain more benefits, which would otherwise go to pay experts.

Value of C-sequestration by community forests

Preliminary data on C-sequestration collected from the VPs in Uttaranchal indicates that the C-sequestration rate varies between 2 t/ha/yr to 4.0 t/ha/yr depending on the condition of the forest. Taking a mean of 3 tC/ha/yr, community forests in Uttaranchal alone (having an average forest size close to 80 ha per VP and numbering about 12,000 out of approximately 15,000 villages in the state) sequester approximately 2.88 metric tonnes of carbon a year. The value of the carbon saved is about Rs 1.29 billion at the rate of US\$ 10 per t carbon. The soil biomass carbon pool is as large as the biomass pool, for which estimations are under progress.

Carbon market opportunity

If trained communities are able to submit proposals of a similar nature through the assistance of intermediary organisations, one VP alone could receive up to Rs 1.08 lakhs (US\$ 2200) per annum for carbon sequestered. Marginalised people of Uttaranchal depend heavily on natural resources, particularly on the forests as a source of energy and for their enterprises. It is not possible to conserve forests for long without enabling the poor people to access modern, efficient energy sources such as LPG, solar energy, and electricity. The funds generated through the sale of carbon can be used to replace the present subsidy on fuelwood by modern energy sources and can encourage communities to save their forests for use as a 'carbon sink'. A special portion of the fund generated from the sale of carbon can be used for developing eco-friendly enterprise such as ecotourism and the infrastructure required for it, and developing organically grown food for niche markets.



Forest trees contribute to storing carbon

Elisabeth Kerthoff

Centre for Rural Technology, Nepal (CRT/N)

The Centre for Rural Technology, Nepal (CRT/N) is a professional organisation established in August 1989 and transformed into a non-government organisation in October 1998. CRT/N develops, promotes, and disseminates environmentally-sound, rural/appropriate technologies to enhance the process of rural development, thereby improving the livelihoods of the rural population. Since its establishment, CRT/N has been involved in policy studies, programme development, and in the implementation of various community-based programmes. The programmes emphasise renewable energy and water conservation technologies that create options and opportunities to strengthen the capability of poor rural communities to respond to their basic needs.

CRT/N is involved in technical services for rural development through renewable energy technology development, environment and natural resources management, small-scale irrigation management, local water harvesting systems, technology for

women, and micro-enterprise development. The organisation is also actively engaged in upgrading rural technologies and in developing new technologies to better respond to rural needs.

CRT/N works closely with government organisations, NGOs, INGOs, educational institutions, and community-based organisations to promote and disseminate appropriate technologies. CRT/N also provides assistance in conducting training and workshops for project staff, grassroots community leaders, and development promoters to enhance their capability in the application of rural technologies.

CRT/N serves as member and national focal point for various regional and international agencies that contribute to the development and dissemination of rural/appropriate technologies, sustainable energy, and gender mainstreaming through an exchange of information, innovations, expertise, and experiences. Since 1990, CRT/N has been one of ICIMOD's key partner organisations in Nepal.

Central Himalayan Environment Association (CHEA)

Initiated in 1981 to address the preservation of the environment and the appropriate development of the Himalayan region in general, and the Central Himalayan region of India in particular, the Central Himalayan Environment Association (CHEA) is a non-profit, independent body. For over two decades, CHEA has contributed to creating conditions that have enabled village communities to manage natural resources and benefit from them on a sustainable basis.

CHEA's emblem is an oak leaf. The species occupies nearly 20,000 sq km in Uttaranchal at between 1000 and 3000 m elevation. Oak forests are associated with water, humidity, biodiversity, and life in general in the hills. The oak is the tree of the masses and is the lifeline of village communities. The fresh new oak leaves are a useful source of fodder, while the acorns are a favourite food for some species of wildlife. The oak leaf emblem symbolises CHEA's role in catering to the livelihoods and needs of the hill communities and in safeguarding the wildlife of the region.

Financial support from the Ford Foundation initially allowed CHEA to evolve a method for eco-development in the minor Khulgad catchment of the Koshi River in Almora district of Uttaranchal, on the central theme of integrated development with people's participation. This was followed by a grant

by the Ford Foundation to replicate the experiment in other areas and to sustain a field laboratory in the Khulgad catchment.

CHEA also stresses the need to link local activities to global issues such as climate change. The current interest in issues of carbon sequestration and ecosystem services through direct community representation is an initiative in this direction.

Now on its 24th year, CHEA has taken up a new initiative, the Livelihood and Sustainable Development Programme. This focuses on action and outreach activities, integrating livelihood perspectives with environment and development that promises to yield income-generating options, from ecotourism and markets for organic products to strengthening livelihood security for marginalised hill populations.

CHEA's vision is prosperous, self-reliant, and secure mountain communities committed to peace, equity, and environmentally-sound sustainable development. CHEA is committed to developing and providing integrated and innovative solutions, in cooperation with regional and international partners, that foster direct action and policy change for overcoming the environmental, economic, and social vulnerability of mountain peoples.



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The 35th ICIMOD Board of Governors and 16th ICIMOD Support Group Meetings: Highlights



Narendra Bajracharya

ICIMOD's Board of Governors and Support Group members, November 2005

The 35th ICIMOD Board of Governors and the 16th ICIMOD Support Group (ISG) meetings were held in Shillong, Meghalaya, India from 23-25 November 2005. ICIMOD's focal agencies, the Ministry of Environment and Forests (Government of India), the Government of the State of Meghalaya, and the G.B. Pant Institute of Himalayan Environment and Development hosted the meetings and provided support, as did

other partners in North East India including the North Eastern Hill University, the North East Region Community Resource Management Project, and the Himalayan Livelihoods Meghalaya Project.

Exposure field trips preceded the meetings. The first was to a community-managed sacred grove in Mawphlang, and to Nonglang Village in the West Khasi Hills, one of the sites of the North Eastern Region



Discussing project issues in the field



A poster session provided a platform for in-depth discussions with Programme Managers

Community Resource Management Project with which ICIMOD has been associated through the IFAD Project. The second was to Cherrapunjee, renowned for being 'the wettest place on earth'. This was followed by a trip to Nongtraw Village to interact with communities and to give everyone a feel of ICIMOD's and its partners' advocacy work for land and natural resources. The field visits provided an opportunity for the Board, ISG members, ICIMOD staff, and partners to discuss issues and challenges at the project sites.

On 23 November, the Centre's Day, ICIMOD's Board and the ISG met with Mr. Namo Narain Meena, Union Minister of State for Environment and Forests; Dr. Donkumar Roy, Deputy Chief Minister of the Meghalaya State; and Dr. Friday Lyngdoh, Forest Minister of the Meghalaya Government. Dr. Ram Prasad Chaudhary, Chair of the ICIMOD Board; Dr. Anne Whyte, Vice-Chair; Mr. Jochen Kenneweg, Chair of ISG; and Dr. Gabriel Campbell, ICIMOD Director General, took turns in welcoming the guests. Dr. Campbell highlighted ICIMOD's mission, underlining the value of regional collaboration and cooperation.

During the Programme Overview session, Dr. Upendra Dhar, Director of the G.B. Pant Institute of Himalayan Environment and Development, and Dr. Kyrham Nongkynrih of the North Eastern Hill University, highlighted the progress made by ICIMOD and identified potential collaborative work in the Indian region of the Himalaya and in North East India. Dr. Madhav Karki, ICIMOD Deputy Director General, Programmes, presented the 2005 Achievement Highlights. An informal walk-around poster session organised in the afternoon

provided the platform for more in-depth discussion with ICIMOD Programme Managers. In the evening, the Department of Art and Culture, Government of Meghalaya, presented a colourful cultural show in honour of the guests.

The Board of Governors, the ICIMOD Support Group, and other associated committees met in sessions from 24-25 November. Dr. Ram Prasad Chaudhary of Nepal, the outgoing Chair, welcomed the new Chairperson, Mr. Ismail Qureshi, Secretary of the Ministry of Food, Agriculture and Livestock, Government of Pakistan.

ICIMOD's progress in 2005 and Plans 2006 were approved. In response to the request of the Director General to commence the search for his successor in time for planning and resourcing for the next medium term action plan, the Board formed a Board of Search Committee.

The Board also decided on the composition of the panel of experts for the forthcoming Quinquennial Review of ICIMOD to be carried out in the Spring of 2006. Dr. Zhao Shidong was reappointed to the Board of Governors for another year as an Independent Board Member, while Dr. Bruno Messerli of Switzerland was appointed to a three-year term, also as an Independent Board Member.

A decision was made to hold two Board meetings in 2006 – a special meeting during June and July in Kathmandu, and the regular annual meeting tentatively scheduled for early November in Pakistan.

Eklabya Sharma, esharma@icimod.org

ICIMOD Programme Advisory Committee Meeting

The ICIMOD Programme Advisory Committee (PAC) held its 12th session on 24 November, as part of the 35th ICIMOD Board of Governors' meetings.

Some of the key issues and recommendations raised by the PAC include the following.

- *On Gender:* ICIMOD needs to better integrate gender mainstreaming in its programmes and projects, and a fuller understanding of the concept is required. Members noted that there is still no real grasp of how gender is integrated and how it fits in as part of the larger framework of social inclusion.
- *On Country Distribution:* The PAC noted that much of ICIMOD's activities are focused on Nepal, India, China, and Bhutan, and less on Bangladesh and Pakistan, with a few activities in Afghanistan and Myanmar. The PAC emphasised the need for ICIMOD to pay attention to countries with little activities and to form a strategy to increase programme activities in these countries. The PAC recommended that ICIMOD set up liaison offices in Afghanistan, Pakistan, and Myanmar.
- *On Programme Synergy:* Related to the 'spread' of programme activities was the issue of numbers and diversity of programme partners. The PAC suggested that ICIMOD focus its activities on a given area and encourage programme work in these areas with the same partners when appropriate.

The ICIMOD Foundation

Established in December 2002, the ICIMOD Foundation is a not-for-profit organisation established in Switzerland to support ICIMOD's research and development work to develop economically and ecologically sound ecosystems in the greater Himalayan region and to improve the living conditions of the rural population there.

The funds generated by the ICIMOD Foundation will be used to support:

- projects to help poor mountain women, men, and children;
- research and the demonstration of technologies and knowledge for mountain development;
- development of innovative ideas and technologies suitable for mountains;
- capacity building and training of mountain peoples and institutions; and
- long-term assistance for the promotion of sustainable development in the Himalayan region.

The Foundation has a Board of Governors composed of selected members of the Board of Governors of ICIMOD and distinguished, reputable individuals in mountain development.

Current members of the ICIMOD Foundation Board of Governors include:

- Dr. Ruth Egger-Tschäppeler, Switzerland - Chair
- Dr. Bruno Messerli, Switzerland
- Dr. Anne Whyte, Mestor Associates, Canada
- Dr. Shoaib Sultan Khan, Rural Support Programmes Network, Pakistan
- Prof. Jamuna Singh, Banaras Hindu University, India
- Dr. James Gabriel Campbell, ICIMOD, Kathmandu, Nepal
- Mr. Milan Tuladhar, ICIMOD, serves as Foundation Secretary

Contributing to the ICIMOD Foundation

Individuals, governments, corporations, and trusts may contribute to the ICIMOD Foundation through direct contributions or endowments. To make a contribution, please contact the ICIMOD Foundation Chair or the Foundation directly.

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- *On Scaling Up and the MDGs:* The PAC noted how important it is for ICIMOD to demonstrate the impact it has had on the lives of 150 million people in the greater Himalayan region. One possible way is for ICIMOD to show how it is contributing to the achievement of the UN Millennium Development Goals (MDGs), but it was unclear how ICIMOD has, directly or indirectly, contributed to these goals.
- *On ICIMOD's focus/added value/impact:* With regards to programmes, the PAC suggested that ICIMOD focus on cross-border and regional issues and actions that other institutions cannot approach. The PAC emphasised that this is ICIMOD's comparative advantage and the Centre should capitalise on this far more.

In addition, the PAC discussed ICIMOD's progress in developing its monitoring and evaluation system and agreed that ICIMOD should continue to

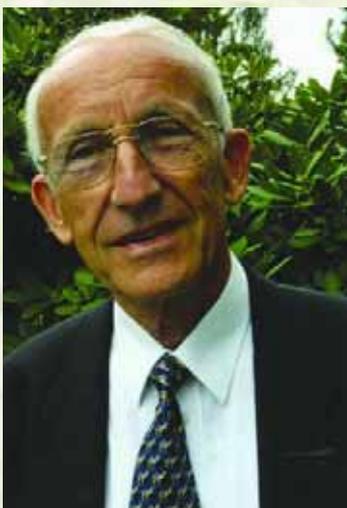
further this, taking into consideration the linkages between M&E cycles and institutional management cycles. The PAC agreed that ICIMOD would not impose its M&E system on its partners.

The PAC also discussed the criteria, questions, and makeup of the upcoming Independent 4th Quinquennial Review of ICIMOD. It noted that the team undertaking the analysis should include experts in social inclusion and gender mainstreaming.

Finally, the PAC emphasised the need for ICIMOD to undertake and prioritise a special initiative for earthquake relief in Pakistan. To this effect, ICIMOD has already initiated an initiative to contribute to rebuilding the livelihoods of the people in Pakistan whose lives have been affected by the 8 October 2005 earthquake, focusing primarily on livestock and agriculture rehabilitation.

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New Independent Board Member: Prof. Bruno Messerli



Professor Bruno Messerli

ICIMOD is pleased to announce that Professor Bruno Messerli, Professor Emeritus at the Institute of Geography, University of Berne, Switzerland, has recently been appointed as Independent Board Member by the ICIMOD Board of Governors. Prof. Messerli will serve for three years.

A Swiss national, Prof. Messerli received his Ph.D. in 1962 and became a full Professor in 1968. He became the Director of the Geographical Institute in 1978, Rector of the University of Berne in 1986, and Professor Emeritus in 1996.

Prof. Messerli's career spans more than four decades. He has carried out pioneering work in sustainable mountain development and interdisciplinary research as well as contributed greatly to research and development in various mountain regions of the world. He has written and published many books and articles in journals of international repute and has received international awards for his initiatives and achievements.

Prof. Messerli has served as Chairman of the Swiss National UNESCO-MAB Committee; was President of the International Geographical Union; Member of the Steering Committee for System for Analysis, Research and Training in Global Change Science; Chair of the Board of Trustees of the International Foundation for Science, Stockholm; and was Member of the Scientific Advisory Board of the Mountain Research Initiative. Prof. Messerli was also one of the coordinators for the UN Highland Lowland Interactive System and contributed substantially to the preparation of the Mountain Chapter (13) of Agenda 21 for the Rio Conference 1992. He was deeply involved in many mountain initiatives such as the Mountain Research Initiative, the Global Mountain Biodiversity Assessment, and Global Environmental Change Research, and in International Year of Mountains 2002 activities. He was also involved in the International Year of Freshwater 2003 and in the 3rd World Water Forum in Kyoto.

Prof. Messerli was one of those who advocated for the establishment of ICIMOD and has been following the activities and achievements of the Centre closely. He was a member of the ICIMOD review team in 1990 and was invited as keynote speaker at the '21st Anniversary Symposium' upon the inauguration of the new ICIMOD Headquarters in December 2004.

Workshops, meetings and trainings

Sharing the results of the 'Glaciers and Glacial Lake Inventory'

In collaboration with the Wadia Institute of Himalayan Geology (WIHG), a half-day workshop was organised at WIHG in Dehradun, Uttaranchal on 14 July 2005 to disseminate the outcomes and results of the collaborative study to inventory glaciers and glacial lakes in Uttaranchal. Seventy-five participants including 40 scientists and professionals from different departments of WIHG and from fifteen organisations attended the workshop. The Asia-

Pacific Network for Global Change Research (APN)-supported project. 'Inventory of Glaciers and Glacial Lakes and the Identification of Potential Glacial Lake Outburst Floods (GLOFs) Affected by Global Warming in the Mountains of Himalayan Region' has been ongoing in India, China, and Pakistan since 2002.

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Workshop launches ICIMOD's work on minority rights and environmental justice

The processes of globalisation, urbanisation, and increasing populations have exacerbated the struggle for natural resources, with an increasingly disproportionate burden being faced by poor and historically marginalised communities living in the greater Himalayan region. Environmental justice concerns in South Asia encompass critical issues such as basic rights to food, potable water, housing material, and survival. These issues are often linked to the loss of collective property rights and access to niche habitats – land, forests, water bodies, and pastures.



ICIMOD file photo

From 22-24 August 2005, the Culture, Equity, Gender and Governance (CEGG) Programme of ICIMOD held a workshop to launch its work on **minority rights and environmental justice in the extended Himalayan region**. Bringing together people from five of its regional member countries, the workshop discussed issues of environmental justice in the region. The workshop was structured around three panels: litigation, social movements,

capacity of marginalised communities towards enabling greater environmental justice in the region. Building upon this inception workshop, the CEGG Programme will undertake research and facilitate capacity building to enhance the rights of marginalised communities to environmental justice over the next two years.

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ICIMOD participates in China-EU Sustainable Development Forum

An ICIMOD team attended the two-day Sustainable Development Forum in Beijing, China from 5-6 September 2005. More than 500 local and international participants joined the Forum where approximately 100 papers on six different themes of sustainable development were presented. As a key partner, ICIMOD presented a paper on 'Sustainable Use and Management of Natural Resources in the Mountain Areas of China: Policies, Issues, and the Way Forward.'

The forum shared the latest research findings and raised awareness on Chinese policy efforts and activities on mountain issues. ICIMOD's participation highlights the Centre's role in the sustainable development of China's mountain provinces in the Tibet Autonomous Region.

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Memoranda of Understanding and Agreements Signed (September - December 2005)

Agreements signed with partners in the greater Himalayan region.

- 8 December 2005: District Road Support Programme (DRSP), Kathmandu, Nepal
Beekeeping training for providing technical knowledge to DRSP participants, Nepal
- 2 December 2005: Dr. Y.S. Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh, India
To upscale beekeeping programme through research and extension in the mountain areas of Himachal Pradesh, India
- 25 November 2005: Central Himalayan Environment Association (CHEA), Nainital, Uttaranchal, India
To upscale beekeeping programme through research and extension in the mountain areas of Uttaranchal State of India.
- 22 November 2005: Honey Bee Research Institute (HBRI), Islamabad, Pakistan
To upscale beekeeping programme through partnership and technical backstopping to rural development organisations in Pakistan
- 8 November 2005: Bangladesh Institute of Apiculture (BIA), Bangladesh
To upscale beekeeping programme through partnership and mobilisation of beekeeper's groups and other stakeholders in Bangladesh.
- 1 November 2005: Dabur Nepal Pvt. Ltd., Nepal
To identify strategic non-timber forest products for the IFAD-supported Western Uplands Poverty Alleviation Project (Nepal)
- 6 October 2005: Centre for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED), Kathmandu, Nepal
To upscale beekeeping programme through partnership and mobilisation of community-based organisations (CBOs) in the mountain districts of Nepal.
- 2 October 2005: United Nations Environment Programme Regional Office, Asia and the Pacific
To develop a pilot knowledge hub for mountain ecosystems to contribute to UNEP's Environment Knowledge Hub (eKH)
- 2 October 2005: United Nations Environment Programme Regional Office, Asia and the Pacific
To prepare the Nepal Biodiversity Year Book 2006
- 27 September 2005: NWFP Agricultural University, Peshawar, Pakistan
To upscale beekeeping programme through research and extension in the mountain areas of NWFP, Pakistan
- 23 September 2005: Alital Multipurpose Cooperative Ltd., Dadeldhura, Nepal
To continue partnership in implementing beekeeping activities and collaborative work in Alital VDC, Dadeldhura district, Nepal
- 23 September 2005: Annapurna Beekeeping and Environment Promotion (BEENPRO) Kaski, Pokhara, Nepal
To continue partnership in implementing the activities of the beekeeping programme in Kaski, Pokhara, Nepal
- September 2005: Sichuan University, Chengdu, China
For cooperation in geo-information capacity building and environment and natural resources management in southwestern China
- September 2005: International Institute for Geo-Information Science and Earth Observation (ITC), The Netherlands
To distribute ILWIS GIS/RS software for ICIMOD and its network of collaborating partners in the Hindu-Kush Himalayan (HKH) Region

Regional partnership workshop prepares country plans on benefit sharing of biological resources

ICIMOD's Culture, Equity, Gender and Governance Programme organised a regional planning and partnership development workshop from 5-7 September on **access rights and benefit sharing of biological resources for marginalised people of the eastern Himalaya**. The workshop focused on

preparing the project's operational and country-specific plans. Mr. Armin Hofmann, Principal Advisor and Project Coordinator, GTZ Nepal, addressed the workshop, which included 25 participants from India, Bangladesh, Bhutan, and Nepal.

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Community and biodiversity in Kohima, Nagaland discussed in a workshop

A four-day workshop, on **'Community and Biodiversity in Nagaland (India)'** was jointly organised by the Nagaland Forest Department, NEPED, and Kalpavriksh, sponsored by the Forest Department, IFACN, the British High Commission, NEPED, and ICIMOD. The workshop was held in Kohima, the capital city of Nagaland from 24-27 October and focused on management systems for biological resources, associated problems, and access to genetic resources related issues. Shri Shyamal Datta, His Excellency the Governor of Nagaland, and Shri I. Kheto Sema, Honourable Minister for Forest and Chairman of the State Biodiversity Board addressed the workshop. The inaugural session was chaired by Mr. Alemtemshi Jamir, the Agriculture Production Commissioner. Over a hundred participants including community leaders, NGO representatives, and senior government officials, participated.

Nagaland has a growing number of community-led conservation initiatives. These include declared wildlife and forest reserves, seasonal or permanent bans on hunting, the harvest of medicinal plants, and regulations against destructive fishing. Conservation



Participants, Community and Biodiversity workshop in Nagaland, India

Krishna Prasad Oli

initiatives are carried out through local-level institutional mechanisms and arrangements by the Village Council, students' unions, youth organisations, and public organisations. The communities themselves and observers report that the initiatives have had a positive impact on biodiversity conservation in Kohima. Major recommendations were made for the future of biodiversity resources management. There is a wealth of traditional knowledge to be shared in medicinal and aromatic plants, techniques for tree pollarding, and complex shifting cultivation systems which should be useful to neighbouring states within India and for other countries of the eastern Himalayan region.

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GTZ and NORAD missions review ICIMOD Planning, Monitoring and Evaluation System

The Norwegian and German governments are important members of ICIMOD's International Support Group. The Norwegian team, composed of Dr. Stein W. Bie and Ms. Marte Qvenild, The University of Life Sciences, Ås, Norway, visited Kathmandu from 2-8 October. Similarly, a GTZ team, made up of Dr. Manfred Gellert and Dr. Christoph Reichert, visited ICIMOD from 15-20 August, 2005.

The Norwegian team carried out a comprehensive evaluation of ICIMOD's Planning, Monitoring and Evaluation (PM&E) system and provided recommendations on improving the system. The GTZ consultants provided an overview of the PM&E system and suggested a milestone for strengthening the system within the MTAP period. Both the missions met with ICIMOD Programme Managers and professional staff to observe and discuss PM&E practices within the Centre's Programmes and co-financed projects.

At the end of their visit, both teams presented and shared their findings with ICIMOD management and professional staff. The mission reports provide initial inputs for the Quinquennial Review of ICIMOD scheduled in May 2006.

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Training in Decision Support Systems demonstrates its use in natural resources monitoring

A three-day training in **Decision Support Systems (DSS)** organised at ICIMOD in late October 2005 by The World Conservation Union-Nepal (IUCN) demonstrated a prototype DSS based on the Sagarmatha National Park scenario. The prototype was developed by the project, Institutional Consolidation for the Coordinated and Integrated Monitoring of Natural Resources Towards Sustainable Development and Environment Conservation in the Hindu Kush-Karakoram-Himalaya Mountain (DSS-HKKH). It illustrates the use of DSS in monitoring the changing conditions of natural resources.

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Narendra Bajracharya

Training communities in beekeeping

As part of the capacity building component of the beekeeping project, ICIMOD in collaboration with its partner organisation, Annapurna Environment and Beekeeping Promotion (BEENPRO), trained 45 farmers (37 women and 8 men) in beekeeping management in October 2005. Two training courses were organised: a week long course from 18-25 October for the Kau Danda Beekeepers Group, where 25 (2 men + 23 women) received training; another week long course was organised from 25-31 October for Pragatishil Ama Samuha of Lekhnath VDC of Kaski district where 6 men and 14 women were trained. The courses enhanced the capacity of rural beekeepers to manage bees in movable frame hives. This will help them harvest more and better quality honey from the indigenous *Apis cerana*, free from dead bees, bee parts, larvae, and hive debris. The training also promoted movable frame hive beekeeping in Kaski district.

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Farooq Ahmad

Representatives of Austrian Development Agency (ADA) briefed

Mr. Robert Zeiner and Mr. Gerhard Pulfer of the Austrian Development Agency visited ICIMOD on 17 October 2005. While at ICIMOD they met with ICIMOD management and the beekeeping project team. They also visited the apiary at the ICIMOD Testing and Demonstration Centre, Godavari, where Dr. Farooq Ahmad, Coordinator of the Beekeeping Project gave a presentation on the goal, objectives, and achievements of the bee project.

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International Workshop discusses ways to manage flash floods in the region

The 'International Workshop on Flash Flood Management and Sustainable Development in the Himalayan Region' was held in Lhasa, Tibet Autonomous Region, (PRC) from 23-28 October 2005. The workshop was organised by ICIMOD, the China Meteorological Administration (CMA), and the World Meteorological Organization (WMO), with support from the Government of Norway and the USAID Office of US Foreign Disaster Assistance (OFDA).

The objective of the workshop was to collect information on the status of flash flood management in the eight member countries of ICIMOD – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and to discuss the preparedness, mitigation, and management of flash floods in the context of sustainable development. In a comprehensive exercise, the workshop participants agreed upon a document now called, 'The Lhasa Declaration', which outlines the workshop's conclu-



Sediment-filled flood wave in a Himalayan river bed

ICIMOD file photo

sions and recommendations and the ways to improve the management of flash floods and related natural hazards in the Himalayan region. The declaration highlights an outreach process as the way forward towards improved flash flood management.

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Training trainers in bio-briquette making

ICIMOD's Godavari Demonstration and Training Centre organised and hosted two training of trainers (ToT) sessions in bio-briquette making in November 2005. This was conducted in joint collaboration with the Success Development Centre (SDC-Nepal), a local NGO based in Butwal, Rupendehi district, and the Poor Water Users Association of Kavre and Kathmandu districts. Training was supported by the Japan Fund for Poverty Reduction through the Department of Irrigation. Five participants from SDC-Nepal (one representative from each region), and ten from the Poor Water Users Association participated. The training aimed at building the capacity of NGO staff and the Poor Water Users Association members to provide training themselves to forest user groups in their working areas and to members of the Poor Water Users Association and other farmers.

Participants first collected 'banmara' weeds (*Eupatorium adenophorum*), pine needles (*pinus spp.*) and 'musure katus' leaves (*Castanopsis tribuloides*). These were then made into charcoal using the charring drum and pit method. Participants were taught how to make the charcoal into powder, mix the charcoal powder with bentonite clay, and press the



Making bio-briquettes

Samden Lama Sherpa

mixture into a honeycomb-shaped mould for sun drying into finished bio-briquettes. In the feedback session, participants said they found the hands-on sessions useful. The skills and knowledge they acquired would be used to train users in their own groups. Bio-briquettes are useful for cooking and heating, while selling the briquettes would be a good means to earn income.

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ICIMOD provides regional perspective at Bhutan's 'First National Workshop on Rangeland Management Policy and Strategies'

The 'tsamdro' or rangeland in Bhutan is a valuable resource in a mountain country where only 8% of the land is suitable for agriculture. Over 400 ha of registered tsamdro provide pasture to more than 350,000 heads of cattle, yak, buffalo, and other diverse species, that in turn provide food and livelihoods (such as dairy farming and wool production) for the Bhutanese people. Rangelands also serve valuable watershed functions and provide biologically diverse resources. A national rangeland policy is thus important to the economy of Bhutan and to other mountain regions of the Himalaya.

In early November, Bhutan's National Feed and Fodder Development Programme, with support from

the Department of Livestock, the European Union, and ICIMOD, conducted its 'First National Workshop on Rangeland Management Policy and Strategies'. ICIMOD provided the regional perspective in this workshop, analysing rangeland issues in Bhutan and sharing the issues and experiences in other countries of the region. Some experiences shared include practical issues in rangeland privatisation in the Tibet Autonomous Region of China, and options that have worked such as indigenous rangeland practices in Chitral, Northern Areas of Pakistan; sustainable farming systems through watershed management in India, China, Nepal, and Pakistan through ICIMOD's PARDYP Project; and Sikkim's ecotourism policy. The need to consider rangelands along with other land uses was also recognised. The workshop comes at a time when Bhutan is revising its Land Act. The discussions and recommendations, particularly on land use and management regimes, hope to influence the provisions of the revised Act. ICIMOD and the Himalayan region – half of which consists of rangelands – will also benefit from a national rangeland development policy and strategies that Bhutan is developing. Bhutan's Livestock Department looks up to ICIMOD for regional perspective and its expertise in mountain development to help them craft this policy.

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PNRRC Bhutan

Observing rangeland issues 'on the ground'. One day of the workshop was spent visiting a registered rangeland in Dhur, Bumthang, which includes a one-acre pasture trial field of the Renewable Natural Resources Research Centre experimenting with various types of fodder. In this field trip, participants interacted with the community and some herders and observed rangeland problems and issues on the ground.

ICIMOD and Mountain Forum participates in 'The World Summit on the Information Society' in Tunis

A four-person delegation from ICIMOD and the Mountain Forum (MF) organised a stand at the exhibition, 'ICT4All' from 15-19 November 2005 and participated in related discussions, workshops, and presentations. ICIMOD/MF's exhibition stand represented the countries of the Himalayan region and the Mountain Forum. There were no other stands from the region except for India and China, so the ICIMOD/MF presence was noticed and the stand was useful in promoting ICIMOD's work in the ICT sector. The Summit had over 20,000 registered



Zibgniew Mikolajuk

The ICIMOD/MF stand at 'ICT4All' attracts queries and interest in the region

participants, thousands of visitors, and over 300 exhibitors. It is considered a milestone event in promoting the role of ICT in poverty eradication programmes as related to Millennium Development Goals. Over 200 people visited the stand and visitors collected information materials about

ICIMOD's ICT activities. Ministers and members of high-level delegations from Afghanistan, Bhutan, and Nepal visited the stand and there were discussions on further collaboration between ICIMOD and the respective governments.

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System of Rice Intensification highlighted on Farmers' Day

PARDYP-Nepal celebrated **Farmers' Day** on 3 December 2005 in Salpani, Jhikhu Khola. Mukti Nath Ghimire chaired the programme, while Dandipani Khanal, District Agriculture Development Officer, chief guest, distributed certificates to farmers and resource persons involved in a training of trainers programme on the system of rice intensification (SRI) option. Over half of the 150 participants were women. Representatives from various government agencies such as the Nepal Agricultural Research Council (NARC), the Department of Soil Conservation and Watershed Management (DSCWM), the Spices Crop Development Centre (SCDC), as well as non-government organisations also participated.

The system of rice intensification (SRI) is an agronomic practice of growing rice by transplanting two-leaf seedlings at 8-12 days old at a wider spacing than usual (generally 25 cm x 25 cm, or even wider). Unlike conventional methods, only a small amount of water is applied while preparing the field for trans-



planting, and the field does not need continuous flooding except during the flowering stage. When the land starts to dry and crack, light irrigation is applied to moisten the soil. An alternately dry and moist soil

Collaboration on Ladakh

Three distinguished scholars, Prof. Janki Andharia, Prof. Vidya Rao, and Mr. Shahaji Narwade from the Tata Institute of Social Sciences (TISS), visited ICIMOD for a week in early September. Their mission was to identify areas where ICIMOD could help in the development of a curriculum for a diploma programme on sustainable development in the Ladakh Autonomous Hill Development Council (LAHDC). The team visited the facilities at the ICIMOD Headquarters and the Demonstration and Training Centre, Godavari, and exchanged views with ICIMOD on how the two organisations might collaborate on the proposed capacity building plan for LAHDC. The visit emphasised the importance of maintaining synergies and complementarities between TISS and ICIMOD. Possible opportunities for cooperation include eco-tourism, water and hazard management, GIS/RS technologies, as well as rangelands and pasture management.

Collaboration with Bhutan Sustainable Development Board (SDB)

A high-level delegation from Bhutan comprising seven members from the Sustainable Development Board (SDB) led by Dasho Meghraj Gurung visited ICIMOD from 4-11 September 2005. The objective of the visit was to explore areas of cooperation in rural development programmes. Meetings and discussions were held with ICIMOD programme staff on areas of mutual interest. For insights into the work of ICIMOD and its partners, the team visited the Demonstration and Training Centre at Godavari, the PARDYP site in Jhikhu Khola, the Dabur Nursery in Banepa, the Balaju Yantra Shala Workshop, SNV Nepal Office, the Poverty Alleviation Fund's Office/HMG Nepal, and the Federation of Community Forest Users, Nepal (FECOFUN). Among the possible areas for joint collaboration the delegation identified replication of land use practices, income generating schemes, rural technologies, rehabilitation of degraded lands, biodiversity conservation and access, medicinal and aromatic plants, sustainable agricultural, tourism development, as well as information exchange and capacity building.

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condition improves aeration and helps the plants to grow more vigorously. SRI is considered an improved way of growing a greater amount of rice using less water.

In testing and promoting SRI as an agronomic option, PARDYP-Nepal supported a Training of Trainers programme using the farmer field school approach. PARDYP-Nepal provided training to 15 lead farmers from the watershed who then ran farmers' field schools in 15 villages, training about 100 farmers. In each field school, the group of farmers implement, observe, study, and draw conclusions about growing rice through SRI and compare the practice with traditional methods.

On Farmers' Day, all groups from the farmers field schools presented the implementation procedures and results of their activities using flip charts and photograph displays, songs, reports, and poems. The results were encouraging.

In the Jhikhu Khola watershed, the rice yield increased by 50% on average. First weeding is more labour intensive than in the traditional practice. Managing irrigation is the difficult part of the system for the areas where irrigation facilities are uncertain. Also on the flat land, where water logging during the monsoon is likely, draining excess water can be a constraint.

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Training workshop shows 'Geo-informatics for Rangeland Resources Management'

The MENRIS and NRM Programmes of ICIMOD organised a workshop on **the application of geo-informatics for rangeland resources management** from 5-16 December 2005. The workshop provided rangeland managers with hands-on training on the use of GIS/RS technologies for mapping rangeland resources, how to plan their use, and monitor changes in rangeland conditions. Designed according to the requirements of partners in rangeland management and biodiversity conservation programmes, the workshop used training materials produced with inputs from a visiting scientist from

Pakistan, Ms. Tehmina Bibi, that participants could already use or apply to their particular rangeland conditions on their return. In order to build on ICIMOD's previous capacity building efforts in rangeland management, 17 participants from six countries namely Afghanistan, Bhutan, China, India, Nepal, and Pakistan, took part in the workshop. They also visited the ICIMOD Demonstration and Training Centre in Godavari, where they took an interest in technologies applicable to mountain farming systems demonstrated at the Centre.

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Stakeholders consulted on Sacred Himalayan Landscape Strategic Plan

The first participatory primary stakeholders' consultation on the **'Sacred Himalayan Landscape Strategic Plan (SHLSP)'** was held in Charikot, Dolakha, from 8-11 December, under the initiative of WWF-Nepal. The Sacred Himalayan Landscape Initiative is a strategy for landscape-level conservation and participatory development and is taking place under the direction of the Ministry of Forest and Soil Conservation, Nepal, with support from ICIMOD, WWF-Nepal, The Mountain Institute (TMI), and IUCN. The boundary of the Initiative

extends beyond Nepal and includes the Kanchenjunga region of India and Toorsa Strict Reserve in Bhutan. WWF-Nepal, TMI, and ICIMOD lead the initiative to develop a strategic plan for Nepal. ICIMOD will be taking the initiative further to India and Bhutan to expand its regional context and reach. The first consultation focused on identifying the major conservation and development issues particular to Dolakha, Ramechap, Kavre, and Sindupalchowk districts and on developing a ground strategy from the stakeholders' perspectives. Major

Exchange Scientists, MENRIS, September - December 2005

- Tehmina Bibi, University of Peshawar, Peshawar, Pakistan, 3 October to mid-December 2005
- A.H.M. Tajul Islam, Institute of Water Modelling, Dhaka, Bangladesh, 17 October to 25 November 2005
- Md. Shaheen Ferdous, Institute of Water Modelling, Dhaka, Bangladesh, 17 October to 25 November 2005
- U Ngwe, U Tint Swe, Forest Department, Myanmar, 27 November to 23 December 2005
- Daw Khin Htar Shwe, Forest Department, Myanmar, 27 November to 23 December 2005
- U Phone Htut, Forest Department, Myanmar, 27 November to 23 December 2005

issues identified were geographical vulnerability and associated calamities, poor land use and resource management, and lack of organisational coordination and public awareness. For further information,

please contact Dr. Sabita Thapa, Coordinator, WWF-Nepal, sabita.thapa@wwfnepal.org and Dr. Nakul Chettri, ICIMOD, nchettri@icimod.org

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GIS capacity building and networking in 2005

GIS technology has many uses, such as in the management of natural resources, in agricultural land use planning, in water resources management, disaster management, environmental planning, and many more. Realising the important role that GIS plays in sustainable mountain development, ICIMOD, through its GIS Capacity Building and Networking activity under MENRIS, has been promoting the use of GIS and remote sensing technology and their applications in various mountain-related issues in the region through training sessions and workshops.

Regional and national training organised in Pakistan, China, and Myanmar

Under the GIS capacity building framework, MENRIS organised and conducted four regional/national-level training courses during 2005 on GIS and remote sensing for different applications, from which 119 professionals from various institutions in the region participated.

Feedback from Training

Participants provided useful feedback about the national training in Pakistan. Some of their statements are as follows:

“...our team from Afghanistan is very happy (to have received) the training. Everyone briefed their supervisors and provided information about the training and the trainers. Thank you very much for organising the training. It was really interesting and useful and we now have...good knowledge in spatial analysis and GIS.”

Shahzad Aryobee, Afghanistan Information Management Services (AIMS), Afghanistan

“...I miss the days we had there at Peshawar, it was really great and I must thank you for all your patience with us while teaching.”

Mohsin Naqvi, Ajad Jammu Kashmir University (AJK) University, Pakistan

Sushil Pradhan, suspradhan@icimod.org

Title of training	Date	Venue
Regional Training <ul style="list-style-type: none"> • Transboundary Landscape Management and Application of Geo-informatics in the HKH 	18-29 July 2005	ICIMOD in collaboration with NRM programme of ICIMOD
National Training <ul style="list-style-type: none"> • Geo-informatics for Rangeland Resources Management • Geo-informatics for Natural Resources and Environmental Management • Geo-informatics for Water Resources Management • Geo-informatics for Natural Resources Management 	4- 16 July 2005 19-30 September 2005 17-28 October 2005 5-18 November 2005	National Centre of Excellence in Geology, University of Peshawar, Pakistan Sichuan University in joint collaboration with its Department of Environment and Architecture, Chengdu, People's Republic of China Institute of Water Conservancy Planning and Design in collaboration with Bureau of Water Conservancy, TAAAS, Bureau of Meteorology, TAR, People's Republic China Department of Forest, Ministry of Forest, Myanmar

ICIMOD shares tools, technologies, and best practices in Myanmar

A one-day awareness workshop on 'Technology, Tools, and Best Practices for Sustainable Mountain Development' was organised by ICIMOD in collaboration with the Forest Department, Ministry of Forestry, in Yangon, Myanmar on 11 November to

mark International Geography Day 2005. The workshop discussed, shared and disseminated knowledge and information about tools, technologies, and best practices. More than 200 participants from various government organisations and universities attended.



ICIMOD file photo

Sharing ideas and technologies on sustainable mountain development



The occasion was graced by the Honourable Minister of Myanmar's Ministry of Forest who inaugurated the workshop. Also present was ICIMOD's Deputy Director General Programmes, Dr. Madhav Karki, who gave an orientation on ICIMOD's different programmes. ICIMOD gave presentations on various themes including a GIS showcase to demonstrate various activities in GIS and remote sensing applications in natural resources management. There was also an exhibition of ICIMOD publications.

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Research Updates and Project News

Medicinal and Aromatic Plants Programme in Asia (MAPPA)

The Medicinal and Aromatic Plants Programme in Asia (MAPPA) was initiated in 1998 and builds on previous research results and on the network partnerships of the International Development Research Centre's (IDRC) Medicinal Plants Network. MAPPA employs a comprehensive and regional approach to the sectoral development of medicinal and aromatic plants (MAPs) in South Asia. ICIMOD began hosting MAPPA from August 2005. The Centre was selected following an open, competitive process of devolution.

MAPPA is a programme of strategic research, collaboration, and networking on MAPs. It develops, provides, and promotes appropriate options, methods, strategies, and technologies and other sustainable solutions to benefit the poor and to help conserve medicinal plant-related biodiversity for use by future generations.

MAPPA emphasises process-based research, incorporating gender and social analysis, which has

the potential to benefit the rural poor and indigenous communities by making favourable impacts on fragile livelihoods and degraded environments. The programme has the scope to influence policy making in biodiversity conservation, sustainable livelihoods, and improved primary health using the MAP sub-sector as a model. MAPPA works with national governments and has facilitated policy and institutional reforms and evolutions targeted at MAPs.

As a regional network of researchers, research institutions, and funding agencies, MAPPA connects government and non-government organisations, universities, research institutions, and the private sector under a multi-donor initiative. It also acts as a knowledge broker providing leadership in strategic research, coordination, and support for livelihood-focused research and sustainable conservation activities on MAPs.

The MAPPA network under ICIMOD will be developed as 'networks without boundaries'. Three

ICIMOD regional member countries, Afghanistan, Myanmar, and China will be added to the network under the devolved programme to bring in new knowledge, national networks, and potential partners.



Dyutiman Choudhary

Ensuring quality organic products



Dyutiman Choudhary

Awareness through information management

MAPPA has stressed supply chain management of MAPs as imperative for developing the MAP sector to meet the objectives of conservation and quality production, and to access regional and facilitate access to international markets. Community-based enterprises and efficient supply chains will be developed, keeping in mind the current operating nature and structure of the sector. Knowledge of the institutional capacities, modes of operation, and internal linkages in the domestic and regional MAP sectors is needed. Understanding the constraints to growth will enable the development of sustainable and needs-based solutions. MAPPA/ICIMOD will follow a knowledge-based approach in developing integrated and transparent supply chain arrangements through the following means.



Madhav Karki

Creating market linkages



Dyutiman Choudhary

Women self-help groups in primary processing.

Community-based enterprises and efficient supply chains will be developed, keeping in mind the current operating nature and structure of the sector. Knowledge of the institutional capacities, modes of operation, and internal linkages in the domestic and regional MAP sectors is needed. Understanding the constraints to growth will enable the development of sustainable and needs-based solutions. MAPPA/ICIMOD will follow a knowledge-based approach in developing integrated and transparent supply chain arrangements through the following means.

i) A livelihood-focused and pro-poor approach – to ensure that supply chain arrangements support poor producers and lead to pro-poor, sustainable growth that benefits poor women and men. The approach will be rooted in the livelihood strategies of the collectors and producers and will enable poor women and men to have the right of access MAP-based economic opportunities and participation in markets on an equitable basis.

ii) A business-based approach – to gain a better understanding of constraints on productivity, competitiveness, business expansion, and investment in the MAP sector. Interventions will target the needs of the sector, while businesses and stakeholders will be judged on their financial and business sense, and on the sustainability of results.

iii) A governance approach – to understand the institutional, policy, structural, and systemic constraints that impact the growth of the MAP sector in the three countries. Understanding the institutional and policy environment will be ensured when designing forward and backward linkages and networks so that community-based enterprises and supply chain arrangements can have a sustainable impact on poverty alleviation and resource conservation.

Under the supply chain management initiative, MAPPA will test, develop, and promote appropriate

technologies, supply chains, marketing strategies, information and communication tools, networks and linkages, and policies. Continuing to focus on organic production of medicinal, aromatic, and dye plants, MAPPA will work towards harmonising regional standards and protocols to improve quality, conserve the resource base, and curb the use of fake products and substitutes in trade. This will strengthen the marketing and bargaining powers of community-managed micro-enterprises and will provide viable and sustainable income generating options.

MAPPA has incorporated strategies as recommended by its programming experience into the management of its MAP supply chain to address gaps in the regional context. There is a felt need in the MAP sector to identify, develop, and promote multi-stakeholder approaches where the possible needs of all are satisfied and trust and ethics in the business is generated. Targeting the supply chains of MAPs could meet the expectations of major stakeholders, allowing sectoral growth and development with increased investment.

ICIMOD's networks provide a comparative advantage for facilitating regional and national initiatives to address rural poverty, MAP resource conservation, and markets and policy imperatives. Its integrated programmes will facilitate the creation of income and employment in remote regions and will provide national governments with opportunities, expertise, and strategies to develop MAPs as a leading sector for national growth and development. ICIMOD will promote models of good practice in niche-based transformation and in the development of poor communities to improve livelihoods and reduce poverty in remote areas of the HKH.

Raghu Bir Singh Rawat, rrawat@icimod.org
Dyutiman Choudhary, dchoudhary@icimod.org

On Nyima's farm

It is crisp and cold on the floodplain of the Lhasa River as Nyima Tashi takes visitors on a tour of his life's work: rows and rows of greenhouses up to 100 metres long. Inside, Nyima's spectacles steam up as he shows us cherry tomatoes, miniature cucumbers and yellow watermelons.

It is clear as he caresses the vegetables that this is a labour of love for the Nepal-trained agronomist who has single-handedly made Lhasa self-sufficient in vegetables. The growing season lasts only four months in the cold and arid plateau. The rest of the year, Tibetans have usually relied on dried and pickled vegetables or imported them from Nepal.



On a stint in mountain farming systems with ICIMOD in Kathmandu, Nyima dreamt one day of growing vegetables on the plateau. Within five years, his Tibetan Academy of Agriculture and Animal Husbandry outside Lhasa is a much talked-about success story. It is testimony to one man's vision and also turns the myth that only the private sector can show initiative on its head.

"Tibet is cold but our winters are sunny," explains Nyima, "so we perfected this greenhouse design that is covered with a blanket at night to keep the trapped daytime heat in." Indeed, the temperature inside stays at 18 degrees at night even when it is below zero outside.

Nyima has a strong marketing team that analyses demand and plans cropping cycles to get the best prices. Encouraged by his success with organic vegetables, the farm is now branching out into exotic fruits, tissue culture, Tibetan medicinal plants and high-value ornamental flowers. Nyima shows us potted poinsettias and cacti that are being readied for the holiday season (pictured). The farm now sells 2.5 million yuan worth of vegetables and flowers and ploughs the profit into expansion. The Academy is sharing this knowledge with other mountain regions of the world and has set up an information exchange data base. Says Nyima: "I was inspired to do this in Nepal, and I'd now like to give back what we have learnt here to farmers in similar climatic regions like Manang, Mustang or Ladakh."

Kunda Dixit, Nepali Times, 6-12 January 2006, Reprinted with permission.

Source: http://www.nepalitimes.com/issue280/nepali_society.htm

Five RMCs share regional flood data in 'real time'

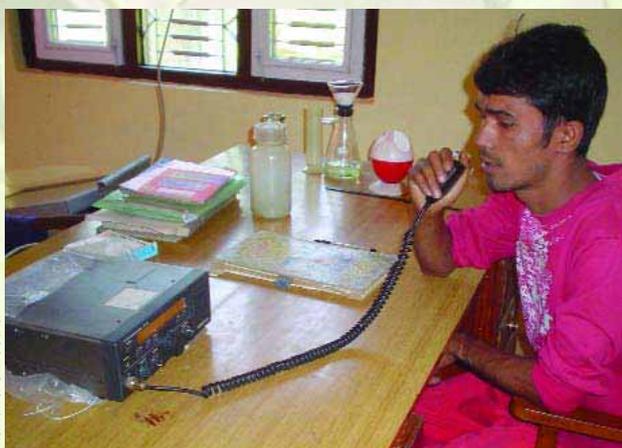
The Regional Cooperation for Flood Forecasting and Information Exchange Project in the HKH region, which seeks to reduce vulnerability to floods and minimise loss of life, conducted its demonstration and testing phase from June to September 2005.

The objective of the demonstration phase was to test the technical feasibility of sharing near real-time data. Five regional member countries – Bangladesh,

Bhutan, China, Nepal, and Pakistan – shared hydrometeorological data in near real-time from selected stations through the project website (www.southasianfloods.org) during this phase, with India participating as an observer. ICIMOD facilitated the sharing of flood data through one or more of these options: a web interface, file transfer protocol, and e-mail. During the demonstration phase, data on water level, stream discharge, and rainfall from more than ten stations were shared daily. The design of the flood information system was upgraded based on the initial feedback from users of the system. The experiences from the demonstration phase indicate that the Flood Information System should, in the future, be automated to enable timely submission of data. This phase has successfully demonstrated the project's technical feasibility as well as the willingness of countries to share information beneficial to all.

For more information, on this initiative, please visit the project website, www.southasianfloods.org

Mandira Shrestha, mshrestha@icimod.org



Mandira Shrestha

Demonstrating the flood information system.

Instrumentation tower to study atmospheric 'brown cloud'

The Indian Ocean Experiment (INDOEX) carried out in February 1999 on the islands of the Maldives revealed a 3 km thick toxic umbrella, or 'brown cloud', hovering over the entire length covering Afghanistan, Pakistan, Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka – among the most densely populated places in the world. The findings come from observations gathered by more than 200 scientists supplemented by satellite readings and computer modelling.

The haze, which is 80% the result of human activity, is composed of a grimy cocktail of toxic ash, black carbon, sulfate, nitrates, acids, and aerosols – tiny solid or liquid particles suspended in the atmosphere. The haze can extend far beyond the Indian subcontinent.

Although follow-up studies are needed to unravel the precise role of the brown cloud, preliminary results suggest serious regional and global implications. The blanket of pollution is reducing the amount of solar energy hitting the Earth's surface by as much as 15%. This has a direct effect on agriculture by infringing on the important process of photosynthesis in plants. Heat is trapped in the lower atmosphere, cooling the Earth's surface while heating the atmosphere. This combination of surface cooling and lower atmosphere heating appears to alter the winter monsoon, leading to a sharp decrease in rainfall over northwestern parts of Asia, and an increase in rainfall along the eastern coast

of Asia. Two consecutive droughts were registered in 1999 and 2000 in Pakistan and the northwestern parts of India, with increased flooding in the high rainfall areas of Bangladesh, Nepal, and the northeastern states of India.

Realising the intensity of the problem, and at the initiation of UNEP and coordinated by ICIMOD, Nobel Laureate Paul Crutzen and Prof. V. Ramanathan visited Kathmandu in March 2001. The visit was followed by a pilot study. The year-long study was informative; however, a long-term study is needed to find out the exact reasons for the haze. A permanent observatory known as the Nepal Climate Observatory (NCO) was set up at the ICIMOD Headquarters, equipped with instruments to measure solar radiation, rainfall, wind velocity and direction, among others.

Radiation instruments

- Diffused pyranometer (measures 305-2800nm)
- Pyrgeometer (4.5 μm - 42 μm , observations of far-infrared radiation)
- Pyrheliometer (200 nm to 4000 nm, direct solar radiation measurement)
- Global pyranometer (measures 305 nm - 2800 nm)
- Biospherical instrument (BSI) (400 nm - 700 nm, measures photosynthetically available radiation) - used mainly for crops

Meteorological instruments

- Air temperature / relative humidity
- Pressure
- Wind direction
- Wind velocity
- Rainfall

The observatory is expected to allow the collection of information on the origins or source of the atmospheric brown cloud.

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Narendra Bajracharya

1. Nepal Climate Observatory (NCO) at ICIMOD
2. Sun tracker (diffused and direct pyranometers)
3. Biospherical instrument/global pyranometer
4. Instruments to measure wind speed and velocity
5. Rain gauge
6. Temperature and relative humidity instruments

New cycle for beekeeping project approved

The Austrian Development Agency (ADA) approved Euro 517,000 for the new cycle of the beekeeping project, **'Honeybees of the Himalayas: Promoting Partnerships with Rural Development Organisations and Networks in the Hindu Kush-Himalayas'**. ADA and ICIMOD signed an agreement in this respect on 12 July 2005. The main purpose of the project is 'to contribute to increasing the income of marginalised, rural populations by promoting conservation and sustainable management of indigenous honeybees. The project has identified nine areas including partnership

development, capacity building, awareness raising, networking, *Apis cerana* selection and management, pollination and eco-services of wild bees, marketing and enterprise development, gender mainstreaming, and baseline and impact assessment, which it will promote through strengthened partnerships with rural development organisations. Under the project, activities will be implemented in six countries of the region: Afghanistan, Bangladesh, Bhutan, India, Nepal, and Pakistan, through rural development organisations and technical institutions.

Farooq Ahmad, fahmad@icimod.org

Project activities in beekeeping begin in Bangladesh, Nepal, and Pakistan

The project, **'Honeybees of the Himalayas: Promoting Partnerships with Rural Development Organisations and Networks in the Hindu Kush-Himalayas'** commenced activities from October 2005 in collaboration with partner institutions in regional member countries of Bangladesh, Nepal, and Pakistan.

As a first step, the project developed partnership arrangements and signed letters of agreement with various organisations. In Bangladesh, an agreement was signed with the Bangladesh Institute of Apiculture (BIA). In Nepal, an agreement was signed with Alital Multipurpose Cooperative Ltd, Alital, Dadeldhura; with the Annapurna Beekeeping and

Environment Promotion (BEENPRO), Kaski; and with the Centre for Environmental and Agricultural Policy Research and Development (CEAPRED) in Kathmandu. In Pakistan, letters of agreement were signed with the Honeybee Research Institute (HBRI), Islamabad; and with Agricultural University (AUP) in Peshawar. The project staff is working to develop partnership arrangements with institutions in Afghanistan, Bhutan, and India to begin activities in these countries. The project intends to identify more organisations in Bangladesh and Pakistan to further expand the scope of beekeeping work.

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Catching up with Mr. A.D. Moddie

The Director General was pleased to have met up with one of ICIMOD's esteemed founding fathers, Mr. A.D. Moddie, earlier this year in Mussoorie, India, at a Himalayan Environment and Tourism Meet. Mr. Moddie remains active in the field of mountain ecosystem conservation, and has published a book on the establishment of ICIMOD, from which the following quotations are taken.



"Between the first walk in the Buddha Jayanti Gardens and the inauguration of ICIMOD ten years down the road in Kathmandu, hope, disappointment, and frustration were our companions. The great encouragement was to find mountain scientists and men of concern all over the world, who became friends and implementers of the idea."

"... and the search has led to more than an international institute known as ICIMOD: it has led to this new consciousness of the holiest of earth's mountain ranges. It is a Himalayan challenge the 20th century has bequeathed to the 21st century in Asia. The Shangrila of a romantic imagination, the long-time Abode of the Gods, has become a high ground of turbulence; earlier geological, now also environmental and technological, political and military."

*'Voices in the Wind', Mountain Environments: The Pursuit of an Idea, 1993
Centre for Development Studies, U.P. Academy of Administration, Nainital, India*

Outreach Activities

ICIMOD takes part in DNPWC Silver Jubilee

ICIMOD took part in a two-day exhibition from 31 August to 1 September 2005 at the Royal Nepal Academy, Kathmandu on the occasion of the 25th anniversary of the Department of National Parks and Wildlife Conservation (DNPWC)/Ministry of Forests and Soil Conservation, His Majesty's Government of Nepal.

Highlighted during the exhibition were ICIMOD's ongoing work in Sagarmatha National Park (SNP) on the Decision Support System (DSS), the Transboundary Corridor concept, Watersheds in the Hindu Kush-Himalayan region. Also on display were ICIMOD publications, and video films on ICIMOD and partners' community activities as well as a running virtual GIS demonstration on Sagarmatha National Park.

HRH Crown Prince Paras Bir Bikram Shah Dev inaugurated the exhibition. HRH Crown Prince spent some time at the ICIMOD stall, taking interest in ICIMOD's work on the east Nepal Corridor to Bhutan, watershed management activities, spatial data on Nepal, the database of mammals and birds, the socioeconomic census report 2001, and the virtual GIS Demonstration of Sagarmatha National Park.



(1) HRH Crown Prince Paras Bir Bikram Shah Dev presents ICIMOD, represented by Dr. Madhav Karki, with a certificate of appreciation



(2) Visitors look at some of ICIMOD's work

On behalf of ICIMOD, Dr. Madhav Karki, Deputy Director General-Programmes, received a certificate of appreciation from DNPWC/Ministry of Forests and Soil Conservation, HMG/N for ICIMOD's efforts in biodiversity conservation and in the socioeconomic development of buffer zone communities in and around Nepal's protected areas.

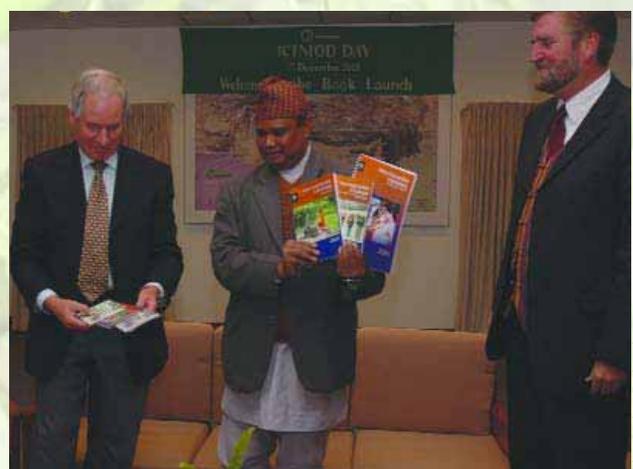
The exhibition was open to the public. Staff from various organisations, universities, colleges, and schools visited the ICIMOD stall, which was another opportunity to promote awareness of ICIMOD's work.

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ICIMOD celebrates 22nd year with book/CD and film launch

ICIMOD marked its 22nd anniversary on 5 December 2005 with a launch of **Women, Energy and Water in the Himalayas**, a set of three books with accompanying CD-ROM versions, and a CD and film on **ICIMOD's Demonstration and Training Centre at Godavari**. Staff, donors, partners including government officials of Nepal, consultants, and the media attended. Dr. Kamal Banskota summed up the contents and significance of the publications and the project on which the experiences, policy guidelines, and the training manual were based. Dr. Eklabya Sharma described the Godavari Training Centre in the context of ICIMOD's work, particularly in NRM and watershed management. Dr. A. Beatrice Murray introduced the other publications produced during the year and 'the other pathways' through which ICIMOD disseminates and shares its work. Putting the publications in context, Dr. Campbell highlighted the statistics on women and their often uncounted contribution to the labour force.

The books and CDs were released by Dr. Ram Prasad Chaudhary, member and previous Chairperson of the ICIMOD Board of Governors and Honourable Member of the National Planning Commission/HMG Nepal; and by Mr. Jochen



The release of 'Women, Energy and Water in the Himalayas'

The three books, **'Policy Guidelines', 'Project Learning' and the 'Training of Trainers Manual', as well as the film on 'Women, Energy and Water in the Himalayas'** capture the experiences and lessons from a joint UNEP-ICIMOD project on incorporating the needs and roles of women in water and energy management in the rural areas of Bhutan, India, and Nepal. The project was supported by the Swedish International Development Cooperation Agency (SIDA) and focused on building the capability of women in the project areas to organise themselves in groups, to identify their own water and energy needs, and to adopt appropriate technologies from a 'basket' of simple and practical possibilities designed to reduce the need for fuel, provide alternative sources of energy, and increase available water close to their homes for drinking and for irrigation.

The project made an impact on the lives of the women in the project areas. They developed their own solutions to their most pressing energy and water needs. Many have used the time they saved to start income generating activities. They also became active members of their communities. The project demonstrated that the issue is not merely which technologies best serve the needs of women, but also how best to enable them to choose from among options those that meet their needs and improve their livelihoods. The Royal Society for Protection of Nature (RSPN) in Bhutan, The Energy and Resources Institute (TERI) in India, and the Centre for Rural Technology (CRT/N) in Nepal were project partners.

The **CD-ROM and film on ICIMOD's Demonstration and Training Centre at Godavari** (which can now be viewed on the ICIMOD website) share ICIMOD's knowledge and findings from more than a decade of work on sustainable mountain farming. The Centre was set up on the southern slopes of the Kathmandu Valley in 1993 and, from the heavily degraded slope it once was, has been transformed into a combination of forest, crop-bearing terraces with contour hedgerows, and orchards of citrus and other fruit trees. A wide range of agricultural technologies and income generating activities are demonstrated at the site, together with water harvesting techniques and renewable energy technologies in collaboration with Practical Action (ITDG)/Nepal, the Centre for Energy and Environment, the Centre for Rural Technology/Nepal, and others. The Centre also has off-site demonstration and training activities in local villages in collaboration with Educate the Children/Nepal. The site's activities reflect the integrated nature of mountain farming, where the growing of cereals and other crops is combined with animal husbandry and forestry in a single self-sustaining system.

The interactive CD provides descriptions and summaries of the activities at the site and thus an overview of the different components of integrated farming in the mid hill areas of the Himalayan region, and of feasible and effective possibilities for improved mountain farming. It is richly illustrated with photos and video clips, a slide show, and an interactive map. The film provides a walk-through of the site, with illustrations and discussions of many different activities.

Kenneweg, Chairperson of the ICIMOD Support Group and Head of Division 203 of the German Federal Ministry for Economic Cooperation and Development (BMZ). Dr. Chaudhary congratulated ICIMOD and UNEP for the joint initiative and thanked SIDA for the financial support. Mr. Kenneweg saw the books as "important pieces of

work on what has been done and what lies ahead" and underscored their usefulness and relevance in the South Asian mountain region context. ICIMOD hosted lunch for staff and guests to cap the anniversary celebration.

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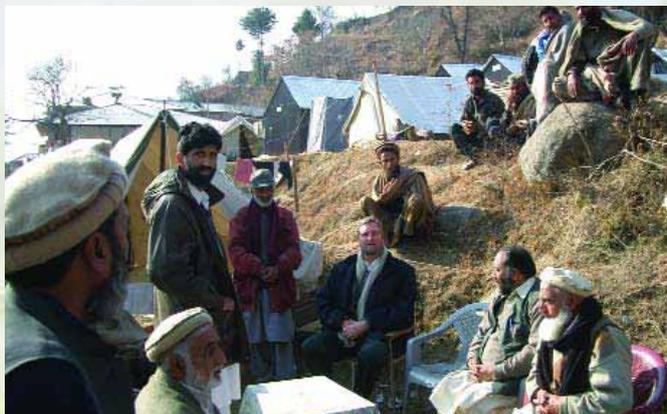
ICIMOD's long-term response to the South Asian earthquake in Pakistan

In December 2005, with the full support of the Board of Governors, ICIMOD fielded a team to assist the Ministry of Food, Agriculture and Livestock (MinFAL), Government of Pakistan, to draw up a project proposal on rebuilding the livelihood assets of the people living in the earthquake-affected areas. The worst affected areas lie in the mountainous region of the country and the Board considered it appropriate for ICIMOD to contribute to the rebuilding process, given the Centre's experience in addressing mountain livelihood and environmental

issues. The team visited earthquake-affected areas in both the North West Frontier Province (NWFP) and Kashmir to gain first-hand insights into the challenges facing the earthquake-affected communities as well as to make an assessment of the potential contributions that ICIMOD could make. During the visit, the team met relevant officials from the government, donor agencies, and non-government organisations in Islamabad, Peshawar, Muzaffarabad, and affected communities in Mansehra (NWFP) and Bagh districts (Kashmir).

At the end of the visit, the ICIMOD team formulated a draft project proposal entitled '**REAL-B3: Rebuilding Earthquake Affected Livelihoods - Building Back Better.**' The document drew extensively on the assessment of losses and damage in the agriculture and livestock sectors carried out by FAO/MinFAL, and the strategic framework for rehabilitation outlined therein. While identifying potential interventions, the team analysed the fit between ICIMOD's competence and the priorities identified by the affected communities, and the policy and strategic guidance given by the MinFAL and the governments of NWFP and Kashmir. Based on this analysis, the following interventions were proposed:

- Livestock production (feed and fodder development, shelter, and backyard farms)
- Crop production (improved seeds, agronomic practices, integrated pest and nutrient management)



The Director General confers with earthquake victims in Hilkot, Pakistan

proven to be socially acceptable and economically more efficient than traditional practices. These include ways and means of substantially increasing farm income, reducing pressure on natural resources, and making more efficient use of water.

The project is proposed to be implemented through the establishment of four nodal sites (adopting the Hilkot model) serving as testing, demonstration, and training centres, from where proven technologies and best practices could be taken up to scale in the larger project area. If fully funded, the project can benefit 80,000 earthquake-affected farm households in the districts of Mansehra and Battagram in NWFP and Bagh and Muzaffarabad in Kashmir.

On 26 December, the Director General of ICIMOD joined the team and had further meetings with the Secretary of MinFAL, the government



Sample of a tent through the efforts of ICIMOD, the Mountain Forum and The Mountain Institute

Narendra Bajracharya

- Income diversification (orchard management, beekeeping, medicinal plants)
- Land rehabilitation (bio-engineering, terrace repairs)
- Forest management (community forestry, agro-forestry)
- Water management (water harvesting, water use efficiency)
- Renewable energy (bio-briquettes, biogas, and solar)
- Farmer support services (farm mechanisation, input supply)
- Institution building (community-based organisations, cooperatives and groups, women's participation, capacity building of partners)

The proposal will provide an opportunity for ICIMOD to scale up over nine years of action research work carried out under the PARDYP Project in Hilkot Watershed, which was also hit by the earthquake. Many of the interventions proposed above have already been tested there and have

representatives of NWFP and Kashmir, as well as some donor agencies. On 29 December the team presented its preliminary report to MinFAL and representatives of other agencies at a debriefing meeting chaired by the Secretary of Agriculture. Based on feedback from this meeting, ICIMOD is now revising the project proposal and is planning to launch pre-project activities in the coming months while working to identify donor partners.

In addition, the MENRIS Programme of ICIMOD is working with the National Centre of Excellence for Geology (NCEG), the University of Peshawar, to provide technical inputs for the earthquake vulnerability and hazard mapping of the earthquake-affected areas. From 2-9 January 2006, a team from MENRIS visited Peshawar and Islamabad, where meetings were held with partner agencies (MINFAL, the Pakistan and the National Agricultural Research Councils [PARC and NARC], the Water Resources Research Institute, the University of Peshawar, the



Tent communities rise over the earthquake-affected areas.

Ministry of Environment, and the Rural Support Programme Network) and with donors, JICA, ADB, and EU. The team conducted field assessments with NCEG, WRRI, and the NARC staff in the earthquake-affected areas. The visit focused on how innovative approaches and geospatial tools such as GIS, RS, and GPS, could be utilised in rehabilitation and reconstruction. Initial discussions were held with national partners and a three-week training course is being put together by NCEG and ICIMOD in March for institutions involved in the rehabilitation. The course will tackle earthquake vulnerability and multi-hazard risk assessment using space technology and geospatial application tools. This will be

followed by a one-day policy workshop and poster exhibition. From a longer term capacity building perspective, a concept proposal is being developed to contribute to Pakistan's efforts to strengthen partner institutions, to utilise modern planning and decision support tools, and to identify approaches useful in rehabilitation and reconstruction.

An earthquake portal containing geospatial information knowledge resources has been created on the ICIMOD homepage:

<<http://www.icimodgis.net/Pak%20earthquake/index.htm>>

Rehabilitating mountain livelihoods after the earthquake will need to look beyond returning to the status quo; it should seek to address the root causes of mountain people's vulnerability and help build their ability to seize opportunities and cope with future threats. Adopting this approach requires understanding the diversity of mountain peoples and communities, especially in relation to their livelihoods.

ICIMOD's rehabilitation plan is based on a vision that moves mountain people beyond the problems of the past. The Centre believes that rehabilitation is not merely about giving people jobs; it must address fundamental social, economic, and environmental reforms.

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Recruitment Announcement: Director General

The Board of Governors of ICIMOD is seeking highly qualified candidates for the position of Director General in 2007 following the completion of the current Director General's second term.

ICIMOD is the leading international institute for sustainable mountain development and expertise on the Himalayan region. ICIMOD was established in 1983 and has its headquarters in Kathmandu, Nepal. It is an internationally funded, not-for-profit organisation.

The Director General reports directly to the Board and leads a strong interdisciplinary and multinational staff. The position requires a highly experienced professional who has:

- an established reputation and experience in senior management including managing scientific research and development programmes
- a broad understanding of the biological, environmental and social sciences underlying sustainable mountain development
- a Ph.D. in a relevant discipline or equivalent experience
- working experience in the Hindu Kush-Himalayan region
- an in-depth knowledge of the main development and policy issues in the region
- demonstrated success in raising international funds

The successful candidate will have excellent communication skills in written and spoken English and will be able to communicate his/her vision to a wide range of stakeholders.

The anticipated date of joining is January 2007. ICIMOD offers an internationally competitive compensation package. It is an equal opportunity employer and strives for staff diversity in gender and nationality. For further information on ICIMOD and a full job description visit www.icimod.org

Send a full CV in confidence with a covering letter and the contact information for three or more professional referees by e-mail to Bourrier International Consultants Inc: bici@sympatico.ca by 15 April 2006.

THE MOUNTAIN FORUM SECRETARIAT

Renewing partnerships

The Mountain Forum Secretariat has renewed collaboration with its closest partner organisation, the Mountain Partnership. The Mountain Forum will support the Mountain Partnership through specific activities such as e-conferences, the development of a resource kit on information and communication technology (ICT) for Mountain Partnership members, among other areas.

The Mountain Forum Secretariat also strengthened its ties with the *Mountain Research and Development (MRD) Journal* by planning a joint agenda for 2006. A joint publication similar to the *Mountain Agenda series* produced in preparation for the celebrations of the International Year of Mountains in 2002 is being planned in view of the upcoming IYM+5 in 2007. In addition, MFS, in collaboration with the regional nodes, will facilitate contributions to MRD's Journal from Mountain Forum members, and subsidised subscriptions to the Journal.

E-consultations

Under the overall moderation of Dr. Pralad Yonzon, Chair of the Resources Himalaya Foundation, MFS conducted a six-week regional e-consultation (22 August-2 September) on Biodiversity in the Hindu Kush-Himalaya (HKH) for the members of Mountain Partnership's HKH Initiative and other interested organisations.

A second e-consultation was conducted for the Mountain Partnership in collaboration with Mountain Forum's regional nodes from 17-21 October. This e-consultation - moderated by Dr. Peter Trutmann, Coordinator of the Global Mountain Programme - was provided to members of the Sustainable Agriculture and Rural Development in Mountain (SARD-M) thematic initiative of the Mountain Partnership as a follow-up to their activities.

Node Manager for the African Mountain Forum

Mr. Moses Musinguzi has joined MF as the node manager of the African Mountain Forum (AMF). Moses is from Uganda, and is currently completing his Ph.D. studies at Uppsala University in Sweden with a focus on Spatial Data Infrastructures in GIS. With Moses on board, Mountain Forum looks forward to AMF taking its rightful place as a strong and active community working towards sustainable mountain development in Africa.

Information services

New MF website

We have recently revamped our website <www.mtnforum.org>. It now features an updated visual design, better site navigation, and enhanced security features. The site is more accessible for users with limited internet access. Images have been kept to a minimum, but if users still find it difficult to download, the website <<http://www.loband.org>> allows browsing of a text-only version of the MF (or any other) website.

Restructuring the online library

To provide world-class services to members, the Mountain Forum Online Library is in the final stages of redevelopment. The new library will be keyword-searchable and will feature standard formatting for all documents, bibliographic information for every entry, searchable annotated bibliographies, and well-organised web resources. The online library is expected to go public in January 2006.

Important changes to MF membership

As of January 2006, some MF services, including discussion lists, the online library, and the membership directory, will be accessible to members only. Membership will remain free, of course. The reason for these changes is that until now, discussion list subscribers have been 'hidden' participants who have not enjoyed the same benefits as members, even though many have contributed a great deal. We have also been unable to accurately tell our funders about who is using MF, and from where. As members, you will help MF to report more accurate statistics to current and future funders, who will help us secure the long-term stability of MF for everyone. In return, members benefit in various ways. To find out more, please visit our website <<http://www.mtnforum.org>> or write to us at secretariat@mtforum.org.

Only registered members will continue to be subscribed to MF discussion lists. If you are currently subscribed to one or more list(s), you are kindly requested to complete one of the membership forms (individual and/or organisational) available on the left sidebar on the page found at the following address: <<http://www.mtnforum.org/rs/mem.cfm>>. If you have any questions or need clarification on the re-registration process, please contact us at membership@mtforum.org.

Mountain Forum Secretariat, c/o ICIMOD, Khumaltar, GPO Box 3226, Kathmandu, Nepal



MF and ICIMOD staff at the World Summit on the Information Society, Tunis

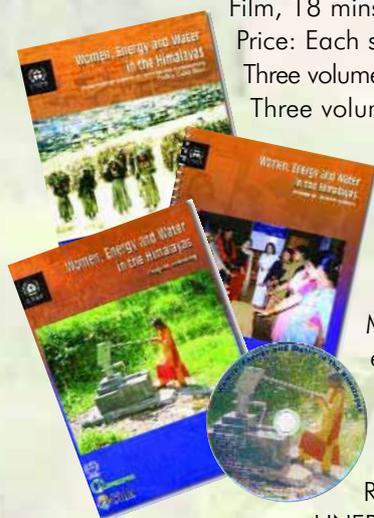
Recent ICIMOD Publications

Major documents published between September and December 2005 are shown below. The three prices quoted are applicable to developed countries, developing countries, and ICIMOD's regional member countries respectively, and include post and packing (p&p). Publications are available without p&p at the Centre itself. Publications can be provided free of charge to institutions actively involved in sustainable development of the greater Himalayan region. Order on-line (see below) or from the Distribution Unit <distri@icimod.org>.

Women, Energy and Water in the Himalayas

- Project Learning 113p
- Integration of Women in Planning and Management - Policy Guidelines 64p
- Training Manual 107p
- Women, Energy and Water in the Himalayas (DVD Film, 18 mins.)

Price: Each separately: US\$ 15, 10, 7.50
Three volumes with DVD: US\$ 45, 30, 22.50
Three volumes only: US\$ 34, 22, 16



The three publications and DVD film on Women, Energy and Water in the Himalayas - Policy Guidelines, Project Learning, and Training of Trainers Manual encapsulate the experiences and lessons from a recent project on 'Incorporating the Needs and Roles of Women in Water and Energy Management in Rural Areas in South Asia'. The UNEP and ICIMOD Project was supported

by the Swedish International Development Cooperation Agency (SIDA) and was carried out by local partners in selected sites in Bhutan, India, and Nepal. The project focused on building women's capacity to organise themselves, to identify and prioritise their water and energy needs, to introduce technologies to reduce the time and effort involved in water and energy management, and to use the time saved in income generating activities.

Project Learning summarises the project rationale and approach used, the implementation process, and the impacts in the project areas. **Policy Guidelines** highlights the importance of bringing the gender perspective to water and energy policy analysis and design, and describes a conceptual framework for developing gender sensitive water and energy policies. The **ToT Manual** provides learning tools for carrying out gender analysis, mobilising communities, identifying prioritised needs and solutions, and designing and using gender sensitive participatory action planning in water and energy and other related fields. The **film** tells the story of the project and brings to life the problems outlined, and

the technologies and solutions described in the other publications. A striking discovery was that a few simple technologies in the water and energy sectors had a substantial impact on the lives of the women even within the short time frame of the project. A women-centric approach focusing on the expressed needs of women in energy and water can make a difference in reducing poverty and meeting the Millennium Development Goals. It is a powerful entry point for engendering development and empowering women.

The publications will be useful to policy makers, planners, and development specialists in national institutions, NGOs, and donor agencies engaged in engendering development and empowering women, especially in mountain areas. Policy makers and rural development practitioners can pick from these experiences those that are useful or suitable to their particular needs for replication and scaling up.

ICIMOD Demonstration and Training Centre, Godavari, CD-ROM & DVD Film (16 mins.)

Price: Each separately, US\$ 10, 7, 5



The ICIMOD Demonstration and Training Centre at Godavari was set up in March 1993 on 30 ha of land provided by His Majesty's Government of Nepal. It is used to test, select, and demonstrate technologies and practices for sustainable development; to train farmers and those who work with them; and as a repository for plant germplasm resources and floral and faunal biodiversity. The film and interactive CD share more than a decade of knowledge, findings, and activities from the Centre.

The CD describes the activities at the site grouped under thematic areas including vegetation, soil and water management, income generation, livestock and fish farming, biodiversity, renewable energy technologies, community outreach, scientific research, training and visitors, and publications. It is richly illustrated with photos and video clips, a slide show, and an interactive map. This is complemented by the film which walks the viewer through the Centre, with illustrations of the many activities taking place there. Brief interviews underline

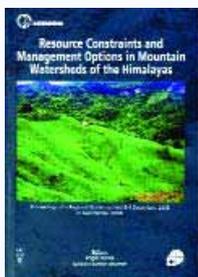
ICIMOD publications on-line – order direct at

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<http://www.earthprint.com/icimod>

the importance of these techniques for farmers, and clips filmed outside the site illustrate how methodologies have been adapted and adopted by local people. Together the publications provide a view of the ICIMOD site, but also an overview of the components of integrated farming in the mid hill areas of the Himalayan region, and feasible and effective possibilities for improvements.

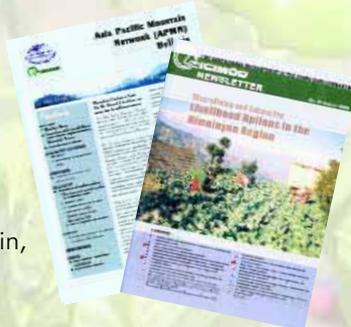


White, R.; Bhuchar, S.K. (eds) (2005) **Resource Constraints and Management Options in Mountain Watersheds of the Himalayas.** 204p. ISBN:92-9115-143-2. Price: \$ 20, 15, 10

ICIMOD's People and Resource Dynamics in Mountain Watersheds of the Hindu Kush-Himalayas Project (PARDYP), funded by SDC, IDRC, and ICIMOD, has been carrying out research in middle mountain watersheds since 1996, focusing on natural resource degradation and community-based options to rehabilitate degraded lands and increase on-farm productivity. This is a compilation of papers presented at a wrap-up workshop for Phase 2 of the Project in December 2003. It assembles three years of research in the five benchmark watersheds by the country teams in China, India, Pakistan, and Nepal, together with the innovative work by others. The papers identify common watershed issues, especially land use intensification and soil nutrient deficiencies, drinking and irrigation water shortages, and water quality problems. Soil erosion and forest degradation were found to be less significant than previously thought. Although agricultural productivity remains a significant issue, opportunities were shown for increasing farm productivity using a proper mix of simple technologies and institutional linkages. The proceedings should be a valuable resource for researchers, development workers, policy makers, and students of natural resource management working in the Himalayan region.

General Publications

1. Newsletter No. 48: Diversifying and Enhancing Livelihood Options in the Himalayan Region
2. Asia Pacific Mountain Network (APMN) Bulletin, Autumn 2005
3. Year Planner 2006
4. ICIMOD Calendar 2006



Other publications by ICIMOD staff (September to December 2005)

Chalise, S.R.; Shrestha, M.L.; Budhathoki, K.P.; Shrestha, M.S. (2005) 'Glacio-hydrological Aspects of Climate Change in the Himalayas: Mitigation of Glacial Lake Outburst Floods in Nepal.' In, *Regional Hydrological Impacts of Climate Change - Impact Assessment and Decision Making*, pp 309-316. IAHS Publ. 295. Wallingford, UK: IAHS Press

Chettri, N.; Deb, D.C.; Sharma, E.; Jackson, R. (2005) 'The Relationship Between Bird Communities and Habitat: A Study Along a Trekking Corridor in the Sikkim Himalaya.' In, *Mountain Research and Development*. 25(3): 235-243

Immerzeel, W.W.; Quiroz, R.A.; De Jong, S.M. (2005) 'Understanding Precipitation Patterns and Land Use Interaction in Tibet Using Harmonic Analysis of SPOT VGT-S10 NDVI Time Series.' In, *International Journal of Remote Sensing*, 26(11): 2281-2296

Jodha, N.S. (2005) 'Adaptation Strategies Against Growing Environmental and Social Vulnerabilities in Mountain Areas.' In, *Himalayan Journal of Sciences*, 3(5): 33-42

Jodha, N.S. (2005) 'Economic Globalisation and its Repercussions for Fragile Mountains and Communities in the Himalayas.' In, Huber, U.M.; Bugmann, H.K.M.; Reasoner, M.A. (eds) *Global Change And Mountain Regions: An Overview of Current Knowledge*, pp 583-592. London: Springer

Kerkhoff, E.; Erni, C. (eds) (2005) 'Shifting Cultivation and Wildlife Conservation: A Debate.' In, *Indigenous Affairs*, 2: 22-29. Copenhagen: International Work Group for Indigenous Affairs

Rasul, G. (2005) State Policies and Land Use in the Chittagong Hill Tracts of Bangladesh. In *IIED Gatekeeper*, 119. 22. London: International Institute for Environment and Development.

Reid, R.S.; Xu, Jianchu; Geist, H. (2005) 'Linking Land-Use/Cover Change Science and Policy.' In, *IHDP [International Human Dimensions Programme on Global Environmental Change] Newsletter* 3/2005

Sherchan, U. (2005) 'Mountain Forum: Network of Networks.' In, *Information for Development [i4D]*. 3(8):18 <<http://www.i4donline.net/aug05/mountain.asp>>

Sharma, E.; Chettri, N. (2005) 'ICIMOD's Transboundary Biodiversity Management Initiative in the Hindu Kush-Himalayas.' In, *Mountain Research and Development*. 25(3):278-281

Shrestha, M.S.; Chhophel, K. (2005) 'Landslide Dambursts in the Himalaya: A Case Study of Tsatichhu Lake in Bhutan.' In, *Proceedings of the International Symposium on Landslide Hazard in Orogenic Zone from the Himalaya to Island Arc in Asia*, 25-26 September, Kathmandu, pp 139-149. Kathmandu: Nepal Landslide Society

ICIMOD E-news

<http://www.icimod.org/enews/index.htm>

- Eighth issue: October/November 2005
- Ninth issue: December 2005/January 2006

New Staff Members

ICIMOD attracts competent professionals in their respective fields from around the region and the world. During the period the following new staff joined ICIMOD.

Mats Eriksson, Senior Water Specialist, WHEM



Dr. Mats Eriksson holds a Ph.D. in Geography and a Ph.Lic. in Physical Geography from Stockholm University, Sweden. For a number of years he worked as a glaciologist on glacier mass balance studies and ice depth measurements at the Tarfala Research station in the Kebnekaise Mountains, northern Sweden. After 'getting his feet a bit cold' he changed the glacial environment for the semi-arid savannahs of East Africa where he worked on soil erosion, landscape development, the palaeoclimate, and environmental change.

In 1998, he took up the position of Programme Officer at the Water Division, in the Swedish International Development Cooperation Agency (SIDA) in Stockholm. In this position he worked with water resources management in a regional and transboundary context in southern Africa and was responsible for the Swedish support to basin-wide projects in Integrated Water Resource Management (IWRM) and Water Governance, in particular the Zambezi (running through eight riparian states), the Okavango (covering three riparian states), and the Pungwe Rivers (two riparian states).

Dr. Eriksson has carried out research in Scandinavia, East Africa, Australia, the Himalaya, Spitsbergen, and the Patagonian Andes, and has published some 25 scientific papers. More recent research in Australia covered fluvial history and changes in river behaviour in relation to land use and climate change.

Michael Kollmair, Programme Manager, CEGG



Dr. Michael Kollmair joined ICIMOD in November 2005 as a Programme Manager for the Culture, Equity, Gender and Governance (CEGG) Division.

Dr. Kollmair has a Ph.D. in Geography from Giessen University in Germany, and was a Lecturer and Senior Researcher at the Human Geography Division of the Department of Geography in Zurich, Switzerland before joining ICIMOD. As a Project Coordinator for the SDC-supported National Centre of Competency in Research (NCCR) North-South development research project, he worked mainly in South and Central Asia. He has also been associated with ICIMOD's PARDYP project since 2003 as a Scientific Advisor.

Working for more than 15 years in the region, especially in Nepal, Dr. Kollmair has experience in a broad area of development studies and in the application of qualitative and quantitative methods with interdisciplinary and intercultural teams. His main research activities are in the social implications of nature conservation projects including questions of equity, participation, marginalisation, and issues of international labour migration.

Manjari Mehta, Associate Scientist, CEGG



Dr. Manjari Mehta recently joined ICIMOD in the capacity of Gender Specialist with the Culture, Equity, Gender and Governance (CEGG) Programme. She has a Ph.D. in Social Anthropology from Boston University, and taught at the Massachusetts Institute of Technology for seven years before returning to India in 2004. She has conducted research on changing patterns of agriculture (Garhwal, Uttaranchal), traditional systems of water management (Himachal Pradesh), and the revival of trans-Himalayan trade and weaving traditions (Kumaon, Uttaranchal) with a persistent focus on gender. At ICIMOD she will be working on addressing and integrating gender concerns into a variety of programmes and projects.

Staff Departures

Anil Shrestha, Consultant, PARDYP, 4 November - 31 December 2005

Che Tao, Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI), Chinese Academy of Sciences, Lanzhou, P.R. China, 15 August to 14 September 2005

Huang Jie, Tibet Academy of Agricultural and Animal Husbandry Sciences, TAR, P.R. China, 15 - 30 July 2005

Jacob F. Ferdinand, Consultant, WHEM, 6 June - 5 December 2005

Sanjay Kumar Madhani, Information and Communication Specialist, 20 December 2002 - 19 December 2005

ICIMOD Staff Members

As of December 2005

Directorate

Dr. J. Gabriel Campbell, Director General
Dr. Madhav Bahadur Karki, Deputy Director General - Programmes
Mr. Milan Raj Tuladhar, Director, Administration & Finance
Support Staff: Ms. Tika Laxmi Gurung, Ms. Anjali Shrestha,
Ms. Prema Thapa

Natural Resource Management (NRM)

Dr. Eklabya Sharma, Senior Agricultural Specialist/Programme Manager
Dr. Pema Gyamtsho, Agriculture Resources Policy Specialist
Ms. Elisabeth E. Kerkhoff, Agroforestry Specialist
Dr. Nakul Chettri, Transboundary & Biodiversity Specialist
Dr. Yan Zhaoli, Rangelands Specialist
Mr. Muhammad Ismail, Assistant Research Officer-RRP II
Mr. Samden Lama Sherpa, Godavari Centre Manager
Ms. Ramkumari Shrestha, Garden Consultant
Mr. Roger John White, Regional Programme Coordinator, PARDYP
Dr. Sanjeev Kumar Bhuchar, Assistant Programme Coordinator, PARDYP
Mr. Keshar Man Sthapit, Country Coordinator, PARDYP
Mr. Anil Shrestha, Consultant, PARDYP
Support Staff : Ms. Sami Joshi, Ms. Neetu Ghale, Ms. Bandana Shakya,
Mr. Pradeep Man Dangol, Mr. Madhav Prasad Dhakal,
Mr. Bhawani Shankar Dangol, Ms. Samma Shakya, Mr. Giri Bahadur
Shrestha, Mr. Jiwan Tamang

Agriculture and Rural Income Diversification (ARID)

Dr. Kamal Banskota, Senior Environment Resource
Economist/Programme Manager
Dr. Narpal Singh Jodha, Senior Associate Scientist/Policy Analyst
Mr. Bikash Sharma, Energy Specialist
Mr. Dyutiman Choudhary, Enterprise Development Specialist
Dr. Ester van der Blonk, Eco-tourism Expert
Dr. John Hummel, Visiting Scientist
Dr. Farooq Ahmad, Project Coordinator, Beekeeping Project
Dr. Uma Partap, Research Officer/Pollination Specialist, Beekeeping
Dr. Surendra Raj Joshi, Action Research Officer, Beekeeping
Mr. Min Bahadur Gurung, Institutional Development Officer, Beekeeping
Support Staff: Mr. Anirudha Nath Shukla, Mr. Satananda Upadhaya,
Mr. Rajendra Shah, Ms. Shova Bhandari, Ms. Prativa Chhetri

Water, Hazards, & Environmental Management (WHEM)

Dr. Xu Jianchu, Ethno-ecologist/Programme Manager
Mr. Mats Eriksson, Senior Environment Economist for Water Resources
Ms. Mandira Shrestha, Water Resources Specialist
Mr. Jacob Fritz Ferdinand, Consultant
Support Staff: Mr. Rajendra Lal Shilpakar, Ms. Sarita Joshi,
Mr. Vijay Ratan Khadgi

Culture, Equity, Gender and Governance (CEGG)

Mr. Michael Kollmair, Programme Manager, Senior Social Scientist
Dr. Nani Ram Subedi, Coordinator, Decentralised & Local Governance
Ms. Radhika Gupta, Coordinator, Equity and Rights
Mr. Krishna Prasad Oli, Regional Coordinator, Strengthening ABSIBIO-EH
Mr. Joy Dasgupta, Assistant Coordinator, ABSBIO-EH
Dr. Mark Turin, Visiting Scientist
Dr. Manjari Mehta, Associate Scientist

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Ms. Srabani Roy, Programme & Project Development Specialist
Mr. Prem Krishna Manandhar, Programme Officer
Dr. Golam Rasul, Policy Development Specialist
Mr. Farid Ahmad, Monitoring & Evaluation Officer
Mr. C.N. Anil, Assistant Coordinator
Support Staff: Ms. Samjhana Thapa, Ms. Mamata Shrestha

Information and Knowledge Management (IKM)

Dr. Zbigniew Mikolajuk, Senior Knowledge Management Specialist/
Programme Manager

Information Management, Communications, and Outreach (IMCO)/IKM

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Ms. Joyce M. Mendez, Publications Editor
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Asia Pacific Mountain Network (APMN):
Ms. Sugam Nepal, Node Manager, APMN

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Mr. Basanta Shrestha, Division Head
Mr. Pradeep Mool, Remote Sensing Analyst
Mr. Cung Chin Thang, Associate Expert - GIS/NR
Mr. Sushil Man Pradhan, GIS Analyst
Mr. Birendra Bajracharya, GIS Analyst
Mr. Samjwal Ratna Bajracharya, Geomorphologist/GIS Analyst
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Ms. Mandakini Bhatta, Mr. Lokap Rajbhandari, Mr. Gauri Shankar
Dongol, Mr. Rajan Man Bajracharya

Global Mountain Forum Secretariat (Hosted by ICIMOD)

Dr. Ana Maria Ponce, Executive Secretary
Mr. Prashant Sharma, Deputy Executive Secretary
Mr. Celine Curi, Programme Development Officer
Mr. Sani Malam Karami, Information Technologies Officer
Mr. Ujol Sherchan, Programme Officer, Information Services & Content
Development
Support Staff: Ms. Anju Rana

Administration and Finance

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Mr. Rajendra Prakash Mali, Budget & Finance Officer
Mr. Kiran Man Shrestha, Ms. Prabha Raj Shrestha,
Mr. Nabindra Raj Shrestha, Ms. Pramila Shrestha, Mr. Akil Nepal
Store Unit: Ms. Jenny Vaidya, Mr. Rabindra Ranjit

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Mr. Chandra Bir Singh Kansakar, Personnel Officer
Ms. Shree Mani Amatya, Ms. Nani Keshari Bajracharya

Communications Unit

Ms. Ayushma R. L. Basnyat, Mr. Pashupati Sadasankar

Security and Maintenance Unit

Mr. Prem Dhoj Malla, Mr. Krishna Tamang,
Mr. Ram Bahadur K.C., Mr. Ram Singh Rai, Mr. Birkha Jirel,
Mr. Kishore Maharjan, Mr. Babukaji Thapa, Mr. Shambhu Thapa

Procurement and Equipment Maintenance Support

Mr. Niranjana Khanal, Procurement & Equipment Maintenance Officer
Mr. Narendra Bajracharya, Electrical Overseer

Photocopy Unit: Mr. Shyam Shrestha, Mr. Ganga Rana

Travel & Hospitality Section

Mr. Rajen Upreti, Travel Officer
Mr. Rishi Ram K.C.

Motorpool Unit

Mr. Mohan Krishna Shrestha, Mr. Kishore Shrestha, Mr. Ram Lal
Maharjan, Mr. Bishnu Magar, Mr. Krishna Maharjan, Mr. Pancha Narayan
Maharjan Mr. Jai Bahadur Subedi, Mr. Sabak Singh, Mr. Dhurba K.C.,
Mr. Sudama K.C., Mr. Chinikaji Maharjan, Mr. Ram Maharjan

New Associates, Consultants, and Interns

Dr. Nirmal K. Bhattari, Consultant, ARID; Ms. J. Mijin Cha, Consultant,
CEGG; Mr. Bijay Kumar Singh, Consultant, PPD
Mr. Sagar Ratna Bajracharya, Consultant, MENRIS
Mr. Rajesh Thapa, Consultant, MENRIS
Ms. Anupa Lamichhane, Consultant, MENRIS
Mr. Anil Shrestha, PARDYP; Mr. Prabhat Kumar, MENRIS,
Mr. Jay Karmacharya, Intern-MENRIS; Ms. Prajna Regmi, Intern-MENRIS;
Ms. Srijana Limbu, Intern-MENRIS,
Ms. Dipit Thapa, Intern-NRM; Mr. Niraj Kakati, Intern-NRM,
Mr. Bastian Flury, Intern-PARDYP-NRM; Ms. Alina Tamrakar, Intern, ARID
Ms. Prabina Dahal, Intern-Personnel;
Mr. Tek Jung Mahat, Intern-Mountain Forum

Life Goes on in Kathmandu...

Some staff members speak of how they coped living in 'extraordinary' times.

Recently Nepal was in the headlines around the world as the country lay in the grip of strikes and curfews prior to local government elections. Media coverage painted a rather grim impression; the reality for most people may have been different. In general for many life went on. This does not mean it was easy for all; many daily wage labourers suffered, and there was and continues to be an underlying fear. Here's how some ICIMOD employees coped during those times.



“ It is not so bad. There are problems of transport, children not going to school, and shops are closed. So I have collected vegetables, rice, and dahl. I had to work a little more to cope with these things, otherwise we're alright. ”

- **Uma Partap**

Pollination Specialist, Beekeeping, ARID

“ This is not a long-term situation. Somehow life is still normal; I get my daily supply of vegetables and other needs for my family. A bandh of one to two weeks will have no effect. People in KTM do not want violence, they are peace loving and prefer to close shop and honour the bandh rather than risk violence. ”

- **Narendra Bajracharya**

Equipment and Maintenance

“ I look at things differently. While there is some unease, on the other hand it has given me a more relaxed time. I bike to work and live a more environmentally-friendly lifestyle. I am also able to think and focus more on my work. I do a lot of writing from home. ”

- **Xu Jianchu**, Programme Manager, WHEM

“ I am a little disturbed because my family is worried and I have to call to reassure them (Sani is from the Republic of Niger), I just work and work - the home-office-home routine. On a positive note, in my area I am able to walk freely and play basketball, the air is less polluted so in some ways it is good for the health... ”

- **Sani Malam Karami**

Information Services, Mountain Forum

“ There is some kind of fear, but we are facing whatever is happening. We take precautions, avoiding crowds and evening outings and public gatherings. As long as the shuttle comes we come to work, we have to work! ”

- **Neetu Ghale**, Administrative Assistant, NRM

“ Except for one time when we were stopped along the main road and had to walk the rest of the way, thank God we're okay. As long as the shuttle comes we go to work. Although of course, it's a little scary. ”

- **Angeli Shrestha**

Senior Administrative Assistant, Directorate

“ It's okay, life goes on. We've stocked up on food. It can be a little irritating, but what to do? It's part of life. ”

- **Joy Dasgupta**, Associate Coordinator, CEGG

“ Where we live - right along the Ring Road - activities are banned on Bandh and curfew days. It's been a way for me to explore the backstreets and observe daily life in KTM. I've stumbled upon some interesting discoveries: cheap fruit and vegetable stalls, a dress repair shop, small corner stores - handy to know when you run out of goods or need something repaired and the major stores are closed. People are friendly and curious and mainly striving to eke out a living regardless of the political weather. It's business as usual in KTM's inner streets. There life goes on. ”

- **Joyce M. Mendez**, Publications Editor, IKM



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