

Policy, Institutional and Technological adaptations for the Way Forward in Forestry in Himalayan Himachal

The Himachal Pradesh Forest Department, which had largely been focused on timber production, has shifted forest policy that recognizes the ecological and social value of environmental services as well as its economic values. A key difficulty in valuing eco-services is in calculating the monetary value of what are typically intangible assets. The clear emphasis remains on the poor, who are most dependent on natural resources. The marginalized forest dependent poor, especially women, are the target group requiring poverty alleviation through natural asset improvement. If the H.P. Forest Department is to effectively make this shift, it must take three important steps: 1) recognize the value of ecosystems and environmental services to halt any further decline in the natural capital stock, especially where it concerns life support systems such as water; 2) develop market mechanisms and incentives that promote future development of eco-services; 3) create a more collaborative decision-making process that recognizes the rights of a variety of stakeholders to participate in decision-making, whether it is NGOs, villages, academia, other public agencies or the private sector. The arena of eco-services has provided (a) a platform for a facilitating dialogue among all forest stakeholders for effective adaptive management; (b) establishment and maintenance of multiple-resource forest databases to accommodate new stimuli in trends, threats and issues; (c) problem solving research capacity; (d) provision for new experimentation like the environmental service payments, along with good forestry practices and (e) healthy regulations to activate the path towards sustainability and development. Market-based approaches to sustainability can help to achieve environmental goals. A key component of achieving sustainability is a balance of environmental, economic and social objectives. For a cash-strapped mountain state such as Himachal Pradesh, it is worth exploring the different types of eco-service payment categories to find ways of generating forest revenue. Further developing economies, are witness to adaptive technology with a focus on energy efficiency and market mechanisms, especially climate friendly energy and renewables/recyclables.

The Himachal Pradesh Forest Department, working with key stakeholders, is adapting to work towards sustainable forest management and poverty alleviation. Its new 'Himachal Pradesh Forest Sector Revised Policy 2005' represents a bold new direction for the forest department, which had largely been focused on timber production. The government has charted a new course to shift forest policy in a way that recognizes the ecological and social value of environmental services as well as its economic values. The change in policy will not be easy. It involves creating opportunities for the poor and enhancing natural resource management. Management agencies will need to change their organizational cultures, create a process that is more transparent and participatory, and find ways to utilize both technological innovation and market mechanisms.

As H.P. and India embarks on their new forest policy, it is worth remembering that "sustainability" is an evolving definition. The perceptions of values in resources change over time and consequently what is necessary to "achieve sustainability" is always a moving target. For example, until recently in the Pacific Northwest, the standing dead trees or snags in the forest were considered inimical, but now they are regarded as elements ensuring forest health. Old growth forests are ecologically very valuable now but until recently they were sought after for conversion. The perception that fire had to be suppressed at all cost has now changed under the realization that healthy forests need fire. Establishing values and their relative importance, setting management objectives and formulating strategies that are sensitive to the perceptions of the local people will be required at every stage of the shift in forest policy.

As the definition of sustainability evolves, so too does the focus on certain groups of stakeholders. Whilst sustainability requires a balancing of priorities between various stakeholders, in developing countries, the clear emphasis must remain on the poor, who are most dependent on natural resources. The marginalized forest dependent poor, especially women, are the target group requiring poverty alleviation through natural asset improvement. David Pearce's Environment for the MDGs (Pearce 2005) makes the case that the poor tend to reside in areas of stress and low-quality natural resources—such as low soil productivity, contaminated water, steep slopes, and polluted grounds—making them increasingly prone to diseases, water shortages, landslides, floods and other hazards. Their low productivity asset base is usually further depleted by large herds of livestock. The few environmental assets that the poor own are typically low quality and rapidly depreciating. The high discount rate of the asset base spurns the poor to undermine the

future when it comes to managing their assets. Rather than managing for the long-term, they tend to take what they can when they can. Social capital and community cohesiveness breaks down under environmental degradation and resource scarcity.

Changing Perspectives on Environmental Services

With the new Forest Sector Policy of Himachal Pradesh, 2005, the government is switching from an extractive-based focus to one that values the many environmental services which forests can provide. If the H.P. Forest Department is to effectively make this shift, it must take three important steps: 1) recognize the value of ecosystems and environmental services to halt any further decline in the natural capital stock, especially where it concerns life support systems such as water; 2) develop market mechanisms and incentives that promote future development of eco-services; 3) create a more collaborative decision-making process that recognizes the rights of a variety of stakeholders to participate in decision-making, whether it is NGOs, villages, academia, other public agencies or the private sector.

1. Valuing Ecosystem Services

The international community recognizes that the natural ecosystem and the environmental services they supply are intrinsic to achieving sustainability. The U.N.-led Millennium Ecosystem Assessment analysis (Millennium Ecosystem Assessment Panel 2005) provides a benchmark for assessing the benefits people obtain from ecosystems, and it concludes that the total economic value from managing an ecosystem sustainably is far superior to the value associated with mere conversion of the ecosystem. The “wild” state is more beneficial than an extraction-based human-dominated model, with the benefit/cost ratio as much as 100:1 (Costanza 2006). To convert natural forests to agriculture, horticulture or other development uses in the name of human well-being comes at tremendous cost, since it means losing out on many important environmental services. The arena of eco-services has provided (a) a platform for a facilitating dialogue among all forest stakeholders for effective adaptive management; (b) establishment and maintenance of multiple-resource forest databases to accommodate new stimuli in trends, threats and issues; (c) problem solving research capacity; (d) provision for new experimentation like the environmental service payments, along with good forestry practices and (e) healthy regulations to activate the path towards sustainability and development (Sayer et al. 2004).

Environmental losses translate into economic losses. A World Bank study has shown that natural environmental capital is a critical component of the asset base in most developing economies (Hamilton et al. 2005). Each year in Himachal, substantial state development funds have to be diverted for disaster management, to handle increasing cloud bursts, landslides, droughts and floods. The Millennium Ecosystem Assessment has estimated that floods are increasing annually; reaching a peak high in 2000, and that other weather catastrophes have also grown over the last half century (Millennium Ecosystem Assessment Panel 2005). Millennium Development Goal 7 targets poverty eradication and points to the need to focus on environmental resources such as soil and water resources on marginal lands, to promote agricultural productivity, thereby benefiting the poor. A shift in policy from an income-based to an asset-based approach is clearly warranted.

In contrast to past theory, environmental improvement is consistent with economic development. Indeed, it is arguable that economic growth cannot be sustained without environmental sustainability. The Environmental Kuznets Curve (EKC) is a classic contention that environmental investments secure a lower rate of return than investments in other forms of capital. Such theories are now being challenged and their premises questioned (Pearce 2005). China provides ample illustration that economic growth at the expense of the environment will eventually limit further development. In 2006, the Chinese government announced a range of new consumption taxes on several products, including cars, fuel, oil, wooden chopsticks and wooden floor panels, to control consumption and reduce negative environmental impacts from over-logging, pollution and natural resource depletion (Reuters 2006). The adjustments are in keeping with the spirit of the ruling Communist Party's 2006-2010 Five-Year plan which aims to move the nation to a more sustainable growth model with less environmental degradation and greater social equity. In its country analysis brief on China: The Environment, the Energy Information Agency of the U.S. states “environmental pollution [in China] is damaging human health, air and water quality, agriculture and

ultimately the economy” (EIA 2003). The heavy floods of 1998 from over harvesting caused US \$24.1 billion in damage, destroying homes and commercial businesses (WFI 1998). Some states are going beyond mitigating natural resource degradation. In Oregon, the non-profit, Ecotrust, is betting that environmental investments are not only good for the environment but also can be profitable. Ecotrust has created a pilot fund that invests in forests which will be managed under a mixed species, longer rotation regime, to prove to shareholders that they can earn a good profit while supporting a more sustainable forestry model (Von Hagen 2005). Some financially viable investments (Pearce 2005) that could be explored in Himachal are:

- *Improved water supply, safe drinking water and improved irrigation (e.g. drip irrigation) can increase productivity and improve sanitation, which would reduce water-borne diseases.* These investments usually save labor and offer a favorable cost-benefit ratio.
- *Soil conservation and land tenure policies can affect productivity and biodiversity and provide incentives to farmers.* Soil conservation brings higher rates of return, increases productivity, slows land degradation, improves food security and demands less labor. Providing secure land titles through good tenure and user right policies helps farmers obtain credit and motivates them to manage for the long-term.
- *Increased access to sustainable energy services also offers higher returns on investments.* There is an urgent need to replace traditional biomass fuels, such as wood (considerations of carbon emission), dung (an effective organic fertilizer), charcoal (polluting) for time savings, improved health, improved soil quality and reduced environmental damage.
- *Protection (from conversion of forests to cropland) and restoration of natural ecosystems is also a good investment, whether it is agro-forestry, wildlife conservation for tourism or fisheries.*

Any successful strategies for optimizing an ecosystems approach must necessarily:

- Formulate an integrated land use policy, especially since fragmented land holdings are unproductive;
- revise land capability classifications and land utilization according to assessments;
- encourage multi-tier/multiple use natural resources management (NRM) practices, avoiding use of productive arable land for development purposes;
- provide adequate financial and technological resources for wasteland and fallow reclamation, regenerating degraded areas, compensating adequately for diverted land and its treatment, and providing technology to achieve best-use practices;
- regulate water use for optimum productivity of land through catchments, regulate watersheds and ground water resources and improve methods of irrigation;
- educate the public on supporting and promoting sustainability;
- cultivate economic livelihood options such as medicinal/aromatic plants, fodder production/pasture improvement, economic use of weeds, production of raw material for other village-based industries, and value added processing; and
- create cross-sectoral coordination and linkages, especially between the various departments that actively feature in the forest sector, e.g. forest, agriculture, rural, animal husbandry, horticulture, irrigation and public health or the tourism departments. Duplication of work would be avoided and transparency would increase.

A key difficulty in valuing eco-services is in calculating the monetary value of what are typically intangible assets. Tangible assets such as timber and some non-timber forest products may be as simple as asking the market price. On the other hand, eco-services such as carbon sequestration, temperature control, soil stability and clean water are very difficult to quantify. Research in this area is growing but remains largely in its infancy. The statistical or theoretical methods have been criticized as opaque and “pie in the sky” values. Clearly the value of nature is inherently complex. Environmental benefit indicators¹ need to be explored and defined before values can be assigned (Boyd and Banzhaf 2005). The markets for eco-services are not yet mature, and are characterized by unsophisticated payment mechanisms, low levels of price discovery, high transaction costs and thin trading (Bass 2001). Proper valuation of natural assets is required in order for market mechanisms to work. To generate cash, most landowners in H.P. resort to traditional land development—either agriculture or horticulture—and have no economic incentive to preserve or enhance the natural functions of their land. If natural assets were properly valued, so that the market compensates people for the public and private ecological services that their land provides, there would be greater incentive for conservation of natural capital. Under an eco-services model, beneficiaries must pay for services they currently take for free, and when there is a conversion of an ecosystem service (e.g. harvesting which reduces water), there should be compensation to the state for lost benefits.

The organizational culture at HPFD has slowly been changing to embrace the shift in policy to sustainable management and eco-services development. The journey has not been easy, involving local and international expertise, and judicial intervention. It began with the 1995 Supreme Court ban on green felling in Himachal, which triggered an interest in eco-services as a solution worth exploring, to offset the declining budget for forestry works. In the following years a dynamic and consultative process involving all stakeholders began, with the comprehensive HP Forest Sector Review (FSR) in 1999-2000 (IIED 2000). The economic valuation of forest products and services was led by Ms. Madhu Verma of IIFM Bhopal, in 2000, with technical assistance from international donor agencies. WINROCK International India (<http://www.winrockindia.org>), partnering with International Institute for Environment and Development (IIED) has explored the potential for markets for watershed protection services and improved livelihoods. Many reform-minded projects followed, with various donor funded participatory experiments in joint forest management, and the establishment of the Himalayan Development Authority—a mountain forum for redress and compensation for conservation costs. There is a conviction that valuing eco-services and developing green solutions will play an integral role in moving the mountain state towards poverty alleviation.

2. Developing Market-Based Incentives for Eco-services

Building a healthy partnership between the public and private sector is critical to developing eco-services programs which are financially viable and sustainable in the long-term. This would help reduce the pressure on primary forests, especially the reserve and demarcated protected forests, which can be qualitatively improved to meet their eco-services role. Alternative sources of raw material should be explored for industries, e.g. bamboo (for papermaking, corrugated roofing, construction and scaffolding, flooring, reconstituted panel and board products), utilization of weeds like lantana (charcoal briquettes), and use of agricultural residues (wheat and rice straw is the non-wood fiber used in the pulp and paper manufacturing). Increased trade in non-woody forest produce (NWFP)² is particularly beneficial to local communities.

According to Powell, White and Landell-Mills in *Developing Markets for the Ecosystem Services of Forests*, there are three categories of payments for eco-services: self organized deals, open trading schemes and public payment schemes. In the self-organized deals or the voluntary contractual agreements, the buyers and sellers establish direct contracts, with property rights and enforceable contracts as clear key elements. These deals tend to emerge when transaction costs hinder private initiatives, for example, involving numerous small landholders or when the private parties lack the authority to implement plans. The open trading schemes are created by the government when it establishes caps or targets on forest services and pollutants. Although the caps are regulatory in nature, they actually create a market mechanism. The imposed caps create a new market for trading allocated quotas, whereby an entity which exceeds the quota may purchase additional quota rights from an entity which has a surplus quota. The public payment arrangements involve direct payments by governments to either encourage or discourage certain activity. For example, farmers in buffer zones may receive annual payments to conserve their forest (Powell et al. 2002). For a cash-strapped mountain state such as Himachal Pradesh, it would be worth exploring these types of eco-service payment categories to find ways of generating forest revenue. One market area already under exploration by the state government of Himachal is the commercialization of NWFP in poverty alleviation programs, especially medicinal plants. The Indo-German Changar Eco-Development Project initiated a successful experimental NWFP project which provided investment capital and technology to a women's group for pickle making. The project sought to empower the people living in the project area to manage their natural resources by themselves, supported by governmental and prominent nongovernmental institutions. Other examples of NWFP projects include collaboration with the International Network for Bamboo and Rattan to produce value-added bamboo products and increasing the skills and capacity of local artisans (UNDP 2002).

There are various barriers to, and shortcomings in, promoting a market-based strategy for developing eco-services:

- government regulatory personnel may lack the expertise to make valuations, and thus be reluctant or slow in responding;

- some environmental groups may feel that market-based instruments would lower the overall level of environmental protection because of the belief that market-based instruments condone the right to pollute or cause damage to natural resources;
- private businesses typically do not push for market-based instruments for various reasons, especially the fear that it will not be cost effective and also because most companies lack internal incentive systems to take advantage of market-based instruments;
- benefits from market-based instruments are often invisible to consumers while costs in the form of fees, penalties and taxes are tangible and transparent;
- privatization of public goods may be questioned by the public; and
- a command and control system of environmental regulation offers politicians greater opportunities for symbolic politics.

Despite its shortcomings, market-based approaches to sustainability can help to achieve environmental goals. Governments can use markets to help them effectively manage public goods such as environmental protection. However, market mechanisms work best when the government apparatus works in partnership with the invisible hand of free market economics (Scherr et al. 2002). The government must set limits on the use of an environmental good or service. Markets look to governments for consistent policy regulations, a robust system to protect property rights, equity, involvement of relevant stakeholders, trust among market participants, easy access to market information, and understanding of possible market externalities (Bayon 2004). Other factors that are necessary for markets to work equitably are fair competition and consideration of the effects of markets on third parties, such as the poor (Bayon 2004). Free markets allow for ongoing price setting, are continuous and replicable, affect large amounts of people and businesses and can move effectively, internalizing environmental costs into the economic system. Well designed markets can complement governmental regulation. For example, in 1999, Texas set a renewable energy target for 2009 and issued renewable energy credits with trading rights, which started in 2002 - this experiment proved highly successful and Texas has taken giant strides in wind energy since then. Even when governmental backing is absent, markets can step in to push eco-services. The Chicago Climate Exchange, a voluntary trading scheme created by a private company called Environmental Financial Products Ltd., established trade in carbon credits in late 2003, even though the US has still to ratify the Kyoto Protocol!

There are various market strategies that are worth considering and are aptly summed up under ‘The Report on Sustainable Forestry for The Wallace Global Fund (Innovative Environmental Technologies 1999)’:

- *Certification and green labeling*: "Eco-labeling" is a voluntary system of environmental performance certification. A variety of eco-labels exist, from government, industry associations, and third-party auditors. Generally, third-party auditors carry greater credibility, although the actual standards and criteria used by these various systems may be quite similar. Forest certification certifies that a given forest area is managed in a way that meets a set of environmental, social and economic criteria. Forest product certification is an extension of that, whereby the manufacturer can prove that the given product contains a certain percentage of raw material from certified forests. To do so, the producer must follow a strict chain-of-custody flow from the forest where the raw material was extracted to the final product. Although the mass market in developed countries has yet to prove with their wallets that they are willing to pay more for certified wood products, big-box retailers such as Home Depot—the largest single wood buyer in the North American market—have purchasing policies which require wood products to be certified. This has effectively forced wood manufacturers to certify their products. Additionally, many state and local governments in the US have implemented green policies such as requiring new public buildings to meet LEED certification (a green building standard), and purchasing departments to buy certified wood. Currently, the majority of green building projects are government construction projects, thus illustrating the critical role which governments can play in leading green policies. Growing consumer popularity, state tax incentives and a robust construction sector are expected to push the green building trend to double-digit growth rates (Rob Fallow, Fortis Construction, personal communication). Green certification systems are an intriguing tool to encourage consumers and producers to value sustainable products, but their application to developing countries may be more limited. For certification to be effective in Himachal, it must address the needs of the marginalized forest dependent communities, accounting for their views and participation, regarding their resource pool. In a developing economy, the benefits and role of certification may be less in terms of economic benefit and more in terms of involving, informing and encouraging open dialogue with the local

communities to improve their livelihood and their traditional legal and customary rights (and responsibilities).

- *Carbon credit trading:* In 1992, the United Nations Framework Convention on Climate Change recognized the need to reduce green house gas emissions and urged the development of carbon credit trading as an important economic incentive to reduce emissions. In such trading schemes, government or some other agency sets limits or "caps" on the amount of carbon pollutants, recognizing that clean air is a public good. Businesses that exceed their designated carbon emissions limit could buy emissions credits from other groups that are able to stay below their designated limits. Although the U.S. federal government failed to ratify the Kyoto Protocol, a number of public and private credit systems have emerged in the U.S., thereby demonstrating that where there is money to be made, the private sector will develop a market, even if the government is not an equal partner. Natsource Asset Management Corp., a private transaction services company, established the first private-sector carbon credit trading system allowing companies in Europe, Japan, and North America to trade credits to meet the Kyoto Protocol commitments. The trading system, called the Greenhouse Gas Credit Aggregation Pool, earned a total commitment of US \$550 million worth of CO₂ from 26 participants. The buyers and sellers are mostly energy companies, utilities, oil and gas producers (Natsource 2006). The Chicago Climate Exchange is a voluntary greenhouse gas market whereby its 130 members agree to voluntarily reduce direct carbon emissions by 4% below a baseline period of 1998-2001 (Chicago Climate Exchange 2006). In 1993, two senators proposed the McCain Lieberman Climate Stewardship Bill, which called for the establishment of a carbon market in the US, to set caps on the green house gas emissions from electricity generation, transportation, industrial, and commercial economic sectors. Unfortunately, the bill failed, by a vote of 55-43 (Pew Center 2006).

- *Government incentives:* Government programs that provide financial incentives for businesses and local governments to improve environmental performance can be as effective as regulatory measures. Examples include Panama's 1994 reforestation law which gives 100% tax breaks for investments in reforestation projects; conservation easements in the U.S.; ecological VAT³ tax in some states in Brazil; tree-planting subsidies in Chile. The challenge is in determining whether a carrot or stick approach works best for any given situation. Negative behaviors, such as polluting, are usually discouraged through taxes and fees, whereas positive behaviors such as replanting can be encouraged through incentives.

- *Penalties-Charges, taxes and fees:* Negative behavior can be discouraged through government penalties levied on the offending party. Taxes or user fees are normally charged for activities with external costs i.e. trade-offs not accounted for in the market. These can be price-based (taxes, fees or fines) which set a direct price on behavior, or quantity-based which set direct restrictions on inputs, emissions, harvest, or technologies. Examples include non-compliance pollution charges levied for excess particulate sulphate emissions from coal-fired power plants in the U.S.; the Oregon green convention taxes levied for pesticide use, with the proceeds going to fund a state-wide reporting system and grants program; royalties/financial payments stumpage fees in Canada; taxes to encourage recycling of tires or car batteries; taxes on excessive application of fertilizers; recreational user fees; pollution charges based on emissions, such as the taxes on chlorofluorocarbons in the U.S.

- *Liability legislation:* A strong legislative framework that enables those who have been affected by a polluter/resource user, to have legal right to bring a claim, is critical to ensuring accountability from resource users. Environmental legislation is based on the "polluter pays" principle, i.e. polluters—not taxpayers—should bear the cost of recovering or compensating for the damage they cause to the environment. The European Union recently adopted an Environmental Liability Directive for all member countries, which makes those causing damage to the water, land and nature legally and financially responsible for that damage (Directive 2004/35/CE, Official Journal of the European Union, L143/56, 30.4.2004). Such a framework is mostly not operative in the developing countries, because those most affected tend to be disenfranchised from the legal system.

- *Debt or equity instruments:* With governmental oversight, capital markets can create a series of financial instruments that offer incentives to potential polluters/resource users to pursue specific environmental actions. This is illustrated in the creation of a forest bank in the Clinch Valley (SW Virginia) by the Nature Conservancy, through which small landowners give up their timber rights in perpetuity, in exchange for a bond with interest payments, with the value being that of the timber they have relinquished. These environmental performance bonds are refunded only if certain environmental standards have been met; otherwise, these are used in mitigation options for problems caused.

3. Creating a diverse and participatory process

A key component of achieving sustainability is a balance of environmental, economic and social objectives. This balancing necessitates that a broad spectrum of stakeholders are involved in helping to formulate objectives, define benchmarks and identify strategies. Thus, the role of the stakeholders is very important.

a) Governmental Agencies

Traditionally, especially in developing countries, it is the government which holds most of the control and authority over natural resource ownership, management, and utilization. Under such systems, control is usually top-down. Even where there is a strong ideological focus on alleviating poverty, policies are typically established at the centre and then implemented outward. The evidence so far has not been very supportive for having centralized control of natural resources. Lack of manpower and resources are stretched over too large an area with poor monitoring of resources resulting in illegal harvesting and overuse. The top-down management style alienates farmers and others dependent on the land, with many forest communities engaged in land disputes with the government over usufruct rights. Central control tends to mean less transparent systems, whereby it is easier for government collusion with special interest groups and businesses, resulting in unfair contractual arrangements that permit overuse of state lands with little economic or social benefits for the community. It is becoming increasingly apparent that sole state authority over natural resources is unlikely to achieve sustainability. Whilst sole state authority is not ideal, strong state control remains important for creating legislative and policy frameworks that encourage private-public partnerships. The state is still the leading regulatory authority, and it must provide enforcement to ensure that laws are met and if not, that penalties are applied. At the same time, the state can dangle “carrots” to the private sector to encourage improved environmental performance. This approach requires that governments make significant changes in their institutional culture and their perspective on natural capital. Governments must value eco-services and they must make good faith attempts to reach out to groups which have probably been marginalized in the past, including small-holding farmers, NGOs, women, and the poor.

In Himachal, there is increasing talk of building new partnerships between consumer organizations, local government, local communities and the private sector. Further, looking to the poor financial health of the state, it would be proper to support a fiscal policy initiative to provide regulatory and fiscal incentives to encourage full-cost pricing⁴ cuts in the subsidies and a move towards a lower resource-intense society⁵. A differentiation between sustainable and unsustainable trade and investment flows towards green GDP⁶ (Gross Domestic Product) is in order. This would require provision of incentives for financial markets for long term sustainability to commercial banks, pension funds and insurance companies. Further, it would do well to invite private financial sector and multilateral agencies to support investment policies that favor sustainable innovations and green technology (Wackernagel et al. 2005).

b) Private Sector

Innovative financing strategies should be pursued with socially responsible private investors, primarily in the field of energy and natural resource management. There are strong indications emerging from investments in various developing countries that such healthy partnerships with local community producers and businesses strengthen long-term supply of food, water and energy renewals and bring lowering of the overall procurement costs involved (Scherr et al. 2002). In many cases, opportunities to maintain the livelihood of the rural poor have been destroyed by non-sustainable activities promoted by outside investors interested in extracting the area’s natural resources (Shilling and Osha 2003). This calls for discouraging investments that are obstacles to sustainability. In Himachal, this was especially true for two forest products, namely *Taxus baccata* and *Dioscorea deltoides*, which were exploited ruthlessly by private entrepreneurs. The current experience with private businesses, as in the extraction of cedar oil, is still not good. The public image of the sector is associated with environmental degradation and profit mongering. As a result, government policies have leaned more towards regulating exploitative businesses than encouraging the private sector. Businesses express concern that there has been a lack of economic incentives from the government and favor easing of restrictive policies (e.g. granting permits for forest produce extraction). For the investment climate to improve, mechanisms are needed to improve communication between private enterprises, the local community, banks and the government. Capacity building through education and training, greater access to finance (credit and insurance), information

networking and a good market support system are necessary to meet the aspirations of the rural populace that is looking for equity and efficiency in market strategies (Landell-Mills 2002). Obsolete technology, lack of trade patents, problems regarding trade or industrial disputes and other market bottlenecks also have to be addressed (Saigal et al. 2002).

c) Non-governmental Organizations (NGOs)

The contribution of non-governmental organizations to society is now well recognized. Sarah Michael, in a report by The Kennedy School of Government, states, “No discussion of poverty, equality or development today is complete without considering the role of NGOs. Whether in the North or the South, NGOs are a visible, respected and entrenched part of many societies” (Michael 2002). NGOs can open up meaningful channels of political expression and can fill up voids created by government in the development arena. Many NGOs grow out of specific concerns for human welfare or rights or for specific concern for the environment (e.g. issues of damage to ecosystem, endangered species, gender issues, poverty alleviation). Non-governmental organizations have many advantages, including their closeness to local populations, ability to innovate and adapt, a process oriented approach to development, participatory methodologies, emphasis on sustainability and cost effectiveness (The Stanley Foundation 1999). The special qualities, roles and barriers attributable to the NGOs are listed in the pamphlet on Nonprofits and Development: The Challenge and the Opportunity, produced by the Institute for Policy Studies at John Hopkins University. The pamphlet describes NGO assets as:

- their flexibility and adaptation to new circumstances is easier;
- they are relatively independent and are free from constraints and impediments and have ability to address neglected subjects;
- they are trustworthy and have a reputation to work for public cause and have accessibility and responsiveness.

Clearly the most important feature is that the non-profit organizations exist outside the contours of the state and are therefore not limited in their scope. This means that NGOs are freer to challenge the status quo. Long-term financial security is a major limitation for many NGOs. Although NGO programs may be effective locally, expanding them beyond small projects or continuing the programs beyond donor-funded terms is a common NGO barrier. In Himachal, few NGOs have the capacity and track record to last for a long time or have the managerial expertise required. For NGOs to flourish and be effective, it is necessary for them to use their limited resources in a targeted way. NGOs should focus on their specific concern, promoting excellence and lobbying for their cause, remaining visible, increasing required support by changing people’s attitudes and values, and ensuring a good source of funds. It would be erroneous to view the NGOs as merely motivated for societal good. Their political leanings (most NGOs are connected with a big environmental agency or conservation body) and perspectives are important for their survival and help them maintain their identity and separateness. Reliance on NGOs increases especially when governmental agencies find it too time consuming or cumbersome to reach out to the local people to increase program outreach, carry out participatory extension work or initiate capacity building. Such use of NGOs to cover the limitations of various departmental institutions undermines the NGO’s qualities and capabilities to perform special roles such as:

- empowerment, where mobilization and promotion is required,
- identifying problems and bringing them to public attention,
- resource mobilization,
- mediation to reduce social, professional, bureaucratic and geographic divisions,
- promoting change through pressure,
- monitoring implementation of public policies,
- leadership development,
- ensuring stakeholder representation,
- legitimization to secure popular support to promote implementation and to promote participation.

NGOs must overcome barriers to their growth which may be a result of 1) inadequate support from governmental and international agencies in terms of recognition, resistance, restrictions; 2) public misperceptions, passivity, lack of appreciation and reliable information; 3) lack of adequate financial resources; 4) insufficient business support; or 5) weaknesses within the non-profit sector in management and implementation, lack of shared identity, and transparency.

In India the role of NGOs in environmental concerns has gained prominence. The increasing influence of the NGO can be seen from the fact that The Centre for Science and Environment in N. Delhi, a NGO headed by Sunita Narain—the champion of the brilliant CNG drive in Delhi to curb pollution—was called upon by Indian Prime Minister Dr. Manmohan Singh to look into the disappearance of the tiger from Sariska and Ranthambore National Parks in Rajasthan. Thus an NGO was asked to investigate an issue which occurred on national lands. When new programs for forest dependent poor were needed in District Kullu in Himachal Pradesh, an NGO called the Society for Scientific Advancement of Hills and Rural Areas (SAHARA) was established in the Great Himalayan National Park at Shamshi. The social and environmental campaigning by NGOs, specifically by Ms. Medha Patkar, helped to get the World Bank Loan for Narmada Dam project cancelled in India. Despite these inroads, however, NGOs in India have not been very effective in changing projects that are already underway. They tend to be more successful at advocating future policy changes, and are most effective when they can participate in the decision-making from the beginning of the design process.

The carbon market strategy holds promise. The planting of under-producing lands means carbon offsets, revenue for environmental projects, a financial incentive for growing trees, and managing forests for the full suite of environmental, social and economic benefits. In Oregon and Washington, there is an increasing trend towards forest management activities that increase permanent carbon storage, with longer forest rotations and thinnings, expanded streamside buffers, wildlife management areas, increased tree retention and forest biomass accumulation through structure-based management. Businesses too are increasingly aware that the public is demanding more attention to carbon emissions management, whether in the form of emission caps, pollution taxes or fines, and that it is likely to face customer hostility towards companies that threaten the environment. The current trend is ripe for more public-private partnerships that promote environmentally friendly activity.

Developing economies, like India's, are witness to adaptive technology⁷ with a focus on energy efficiency and market mechanisms, especially climate friendly energy⁸ and renewables/recyclables. Emerging technologies are being considered in Himachal, including:

- Tapping of energy through solar (cookers and lighting) and wind power for the cold deserts.
- The field of bio-engineering (vermi-composting for starters) and bio-technology which offer solutions to hazardous waste generation, climate change emissions and air and water pollution. Effective and resource efficient processes (the smokeless Dhauladhar chullah of the past) with benign industrial and material flow solutions targeting pollution, especially connected with energy processes for hydro-power and cement plant design. Biotechnology has great potential in forestry, wherein priority is given to biology, diversity and propagation rather than on genetic modification. Bio-prospecting too, is advantageous, as HP has unique genetic resources and renewals, which can help reduce dependence on fossil fuels.
- The design of the built environment using local materials, chemicals, products and systems for construction (mud and straw) which work towards sustainable regional environments and healthy communities.
- Satellite imagery and detection, spatial information and decision-support systems.

Aside from technology, ecosystem services and biodiversity management require being sensitive to the perceptions of the local people in the interest of conservation i.e. it is necessary to design for specific—to actually reduce the pressures of firewood gathering there is a need to put in place acceptable and viable energy alternatives—whether non-conventional or otherwise. The right course would be to move away from using fossil fuels and to invest in new energy technologies; withdrawing investments from technologies that degrade the environment and those that are obstacles to sustainability (Wackernagel et al. 2005).

Conclusion

The sustainability path in Himachal calls for proactive management that fuses anticipation, adaptation and preparation for future environmental challenges such as a burgeoning population, climate change, paucity of drinking water, and natural disasters. To be effective, the government needs access to funds to implement environmentally good intentions and good practices, in the name of development. Changing organizational culture in the governmental departments would have meaning only if a transparent

participatory process is forged. Exploring market-based instruments calls for careful design, implementation and matching complementing institutions. Some of the groundwork has already been laid, with new forest policies, reorganized land management units and international donor aid helping to improve the institutional capacity of Himachal's Forest Department. All the planning and build-up must now culminate in action.

1 Ecological Benefit Indicators (EBIs) are quantitative and transparent measures of ecological and social conditions which are derived from geospatial information and other public data sets.

2 NWFP as defined by FAO, consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests, especially medicinal plants, resin, bamboo, lac, mushrooms, mosses, lichens, tans, honey, musk, gum, cane products etc.

3 Value added tax (VAT) is an indirect tax, similar to a sales tax and is levied at the time of the sale of goods and services—the tax is collected from someone other than the person who actually bears the cost of the tax (namely the seller rather than the consumer)

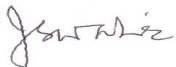
4 Full cost pricing means removing subsidies and getting prices right. This can be an effective response to enable market forces to push enterprises to modernize or close altogether.

5 A lower resource-intense society, with less wastes and consumption would be less taxing and not exceed ecological production leading to a decline of natural assets.

6 GDP as of present is de-linked from environmental degradation and human welfare. Green GDP would value nature and its goods and services. The UN's Human Development Index (HDI) is a measure capturing how a given nation meets basic living standards through life expectancy, education and income.

7 In technology, world wise, the future promises hybrid locomotive ("Prius" type), solid state lighting, hydrogen technologies, solid oxide fuel cells, solar technologies, "nano" technologies, biotech and bioengineering and so many other advances.

8 e.g. geothermal, solar, wind power, poly-generation and methane recovery and biological projects, involving reforestation that use trees as carbon sinks to wash CO₂ emission from the atmosphere.



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