

RURAL DEVELOPMENT FORESTRY NETWORK

Changing Forest Use and Management in the Alps and the Himalayas: A comparison between Switzerland and Nepal

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Summary

This paper considers the parallels that may be drawn between changing forest use and management in a Himalayan and an Alpine region. It focuses on three inter-related issues: historical changes in the provision of society's energy requirements; the growth of democracy – which has provided local people with greater political influence over forest management decisions; and the conflicts which have occurred along the way between growing urban and rural populations, with their different interests and needs.

While their mountainous topography served in the past to isolate the Alpine and Himalayan regions from the outside world, this is no longer the case. Indeed, it is argued that changes in forest use and management are inextricably linked to macro-economic and political changes at the global level – a key factor being the provision of energy. As a country of central Europe, in the late 19th century Switzerland was caught up in the Industrial Revolution, the immediate effects of which on the forests was devastating. They were cut and felled extensively – first mainly for fuelwood and then for timber. However, as coal became the major energy source and countries of the South became a source of many raw materials, the reduced pressure on the forests, combined with appropriate legislation, provided opportunities for their regeneration. Currently, in the 'Consumer Age' – fuelled from the 1950s onwards by oil, and wholly unsustainable – the production of timber tends to play a minor role in forest management. The standing stock is now continually increasing.

In Nepal, forests have traditionally provided a wide range of subsistence needs, and until quite recently have been adequate in extent and quality to meet the requirements of its population. However, changes since the 1950s bear many

parallels with earlier events in Switzerland. Fuelwood still represents the country's major source of domestic energy, and contrary to Switzerland's experience, affordable alternative energy sources are not readily available. The increasing size of urban populations is creating new pressures on the forest, particularly concerning the supply of timber. The paper discusses the extent to which the experiences of Swiss forestry are pertinent to Nepal today, and whether any lessons can be learned from them.

Introduction

In both Switzerland and Nepal, forests have played a central role in traditional subsistence livelihoods. Converting solar energy to cellulose and lignin, forests represent the major source of energy – most obviously as fuelwood, but also in terms of animal fodder and fertiliser. Both Swiss and Nepalese peasants have traditionally built their houses of wood and stone, and warmed themselves and cooked their food on wood fires. They have driven their animals into the forest in search of fodder, and cut bundles of foliage to feed them early and late in the day (especially in winter); and their fields have been fertilised by a mix of animal dung, agricultural residues and leaf compost from the forest. While many people in Nepal still largely follow such subsistence livelihoods, very few do so in Switzerland. The pairs of photographs on the following pages, however – taken in the 1920s and recently in Switzerland, and in the 1980s in the Himalayas, reveal striking similarities in subsistence strategies.

This paper compares the historical development of forestry in one upland area of Switzerland, the Bernese Oberland, and the more recent development of forestry in Nepal. The Bernese Oberland lies within the canton of Berne, and is reasonably typical of the Alpine region in general. However, it is exceptional in the detail of documented material about forestry development – provided by a far-sighted District Forester named Karl Kasthofer, who began his work in the region in the early 19th century.

The Bernese Oberland of the 19th Century

Subsistence farming was the basis of the economy in the Bernese Oberland of Karl Kasthofer's day, as it was in most other Alpine valleys in Europe. Cheese and other dairy products were the main dietary staples, while potatoes and various cereal crops were grown on the valley floor (Pfister, 1986:381). The poor lived mainly on goat's milk and potatoes. Although animal husbandry was combined with crop cultivation to help reduce the risks inherent in agriculture, it was not always possible to gain an adequate subsistence, especially when little remained after an inheritance had been shared or debt had accumulated, or when families had no land of their own. Commerce was still conducted on a small scale, with trade restricted to a limited number of commodities. Cheese and cows were exported. Imports included iron, and salt for conserving cheese. No benefits had as yet been derived from external inputs of energy or fertiliser.

Constraints in agricultural production were imposed not so much by a lack of land as by a shortage of nutrients to fertilise the soil. The local nutrient cycle was still leaking: only about one-fifth of the animal dung available was actually collected and spread on fields and meadows (Pfister 1990:44). Fodder grew poorly and was of little nutritional value; cows produced at most two to three litres of milk per day.

Inter-rural conflicts

In this world of limited resources, the forest played a central role. Although vast tracts of primary forest had long since disappeared by Kasthofer's time, remote secondary forests existed in a close-to-nature state, while the tree cover of forest land in the vicinity of settled areas was often deeply influenced and altered from centuries of use. Aside from serving as a source of fuel, the forests also supplied fodder leaves. Since little grain was cultivated, little straw was available as a binding agent for cattle dung. Autumn leaves were thus substituted for straw. In Kasthofer's day, it was impossible to find a beech (*Fagus sylvatica*) forest anywhere in the Bernese Oberland whose leaves had not been raked up and gathered to be mixed with dung.

The chronic lack of fodder forced farmers to use the forest as a grazing area. Every morning herds of goats flooded the slopes above the villages, working their way into the forest higher up, where they wreaked havoc on the natural regeneration. Yet it was impossible to ban livestock from the forest. Most forest stands were

subject to grazing rights, which in many cases had been granted to third parties rather than to the actual owners. ‘This is the eternal war between the forest owner and the man with grazing rights,’ wrote Kasthofer, ‘and it does not seem to occur to either that they might reach a friendly agreement’ (Kasthofer, 1828b:18).

Forest grazing must also be understood as a consequence of the existing social structure of the time. Depending on the village, up to a quarter of the families then living in the Oberland possessed no land of their own. The prevailing mythology of democratic ideals contrasted with real conditions. The Switzerland of Kasthofer’s time was a class society, and the class structure determined access to natural resources. Only old-established families had political rights, as well as the right to use common property – i.e., to graze their livestock on meadows in the vicinity of the village or in Alpine pastures during summer, and to harvest fuelwood and timber from the forest.

The landless, most of whom had immigrated to the area in later times, had no access to these valuable resources. They came to rely on the forest as their primary source of livelihood. Here their presence and their activities were tolerated, even though they had no official rights to use forest resources. They gathered branches to use as fuelwood, which had been left behind by those who did have resource rights, and scraped up litter and forest soil to fertilise the potatoes they grew on tiny, leased patches of land.

The landless also kept goats, which browsed in the forest when the snow had disappeared. During the winter, goats partly fed on dried leaves. When the underprivileged required timber for building, or some other resource to which they were not entitled by established rights, they were forced to trespass and appropriate whatever they needed to meet their needs. The more marginal their existence, the more they needed the forest in order to survive.

Urban-rural conflicts

Another population group that was making demands upon the forest in the Oberland was the inhabitants of Berne, at that time one of the most powerful city states north of the Alps. Like all other towns at the time, Berne, which is connected by the river Aare with the Oberland, acted as a sort of black hole, devouring energy and matter from its surroundings. As early as the 14th century its citizens sought to conserve their forests by means of strict regulations. Later, it was stipulated exactly who

could receive wood for cooking and heating, and in what amounts. High-ranking officials, for example, were entitled to 50 times as much wood as spinsters or the keepers of the city bear pit. Yet despite warnings against careless misuse and waste of a resource ‘for which we are responsible to our children and children’s children’ (Stuber, 1993:61), by about 1800 the citizens of Berne, who numbered some 12,000 at the time, were consuming around 50,000 cubic metres of firewood per year.

In a quest to satisfy its demand for energy, the city of Berne extended its search for wood to the Bernese Oberland. Rafting timber down the River Aare was not only an easy way to ensure supplies of wood but also an inexpensive one, once the city had reclaimed its long-standing rights.

The city’s exercise of power provoked resistance everywhere in the Bernese Oberland and spread ‘mistrust of an authoritarian forestry administration throughout communes that were entitled to use the forest’, as Kasthofer pointed out in 1818. As early as the 18th century the people of Interlaken had sent a note of protest to Berne complaining about clear-cutting on the Big Rugen hill. Shortly before the revolution of 1798, a commune in which Berne had been asserting its sovereignty won a lawsuit against the city. This subsequently triggered an avalanche of similar court cases.

Karl Kasthofer experienced a memorable example of the conflict between Berne and the rural Oberland when he sent a significant consignment of free larch (*Larix decidua*) seedlings to be planted by the local population in the village of Meiringen. However, the villagers wanted nothing to do with this development aid from Interlaken. They were utterly convinced that once trees were planted on their pasture-land, the cantonal authorities would later claim the right to harvest timber there. Therefore, after long discussions, the (by then dead) seedlings were finally shipped back to Interlaken ‘to make it clear to the District Forester exactly what people thought of these grand designs of a state servant’, as Kasthofer later described the incident.

Kasthofer later discovered the conflict behind this singular event. The land at Meiringen and the valley of Hasli had been the property of the city of Berne since the 14th century. As landowner, the city enjoyed the right to use the forest. At first, however, rather than exercising its sovereignty, the city granted local farmers extensive rights to graze their animals and harvest timber. In practice, this meant that the local inhabitants were the only ones who enjoyed rights of use in the forest.

Because they had been allowed to exercise these rights for such a long time, they came to regard them as inalienable.

However, when iron ore was discovered on this land in the 15th century, the city of Berne suddenly reasserted its sovereignty and permitted outside leaseholders with mining concessions to cut wood and burn it to obtain charcoal. The smelting of iron ore required such enormous amounts of fuel that infringements of this clause became the order of the day. It was not long before conflicts broke out between the local population and the miners.

The mines were abandoned only shortly after Kasthofer took office. Berne had for centuries taken half a tonne of cannon balls as a rental fee, and for centuries the city had also tried to secure the timber necessary for smelting iron ore. Yet local farmers continued to insist on their rights. The farmers took steps to protect their interests by denying the miners as much timber as they possibly could. They let their livestock graze on cut-over forest, and later cleared the land.

As a result of this long-running dispute, extensive tracts of forest land became degraded, and some forests disappeared completely. In many places avalanches and rock-falls cut paths through the forest where even today trees still do not grow. In the final analysis, the returned larch seedlings were an expression of this centuries-old conflict, and it exemplified the historic resistance of the people of Meiringen to what they perceived as the power of a haughty overlord. It was in this same spirit of resistance that they refused the aid offered by District Forester Kasthofer, who was, after all, a representative of the state.

Different patterns of forest use

Underlying this ‘spirit of general resistance’ against anything that came from Berne was a fundamental conflict of interests. From the perspective of the local farmer, forest, field and meadow comprised an integral whole. In order to be self-sufficient, farmers were most in need of leaf fodder, leaf litter, fuelwood, and grazing areas for their livestock. For beams, planks and boards they had only a subsidiary need.

Urban people, on the other hand, had very different needs. Wood was their only source of energy and a very important raw material until well into the 19th century, which made it an extremely valuable natural resource from their point of view. Karl Kasthofer was appointed District Forester mainly because of the hope in Berne that

he would succeed in enforcing the city's increasingly contested sovereignty in the Oberland and 'alleviate the shortage of wood through effective policy measures' (Kasthofer, 1850:221).

The science of forestry was born in the 18th century as a child of scarcity, primarily in towns in Germany and France. Foresters may be regarded as the first experts on questions of energy and natural resources. From the outset, they saw rural populations as a problem. In their view, traditional ways of harvesting forest products constituted a destruction of resources which could be much better used by the city. This fundamental conflict over resource use was clearly reflected in the terminology of forestry that developed at this time: products traditionally obtained from the forest by rural people were regarded merely as 'minor forest products', while wood produced for townspeople was elevated to the status of a 'main product' (Küchli, 1994a:658).

Given their origins, it is not surprising that most of the first European foresters represented urban interests. They insisted on separating the forest from the field so as to manage the forests without disturbance from farmers. Yet this was not possible in an area where so many people were dependent on subsistence farming.

Kasthofer, however, recognised that forestry should serve the needs of agriculture. While he believed it possible to manage forests better and to increase production, he realised that every measure employed by foresters would also have to focus on providing 'fodder for cattle and fertiliser for the cultivation of food crops'. He scoffed at colleagues whose 'exalted professional vanity turned to bitter anger when they were unable to transform everything into timber under the wave of their oaken sceptres' (Kasthofer, 1818:XIV). He considered that the forester who concentrated only on the production of wood would be unable to rescue the forest, and forest laws which needed legions of bureaucrats to enforce them would 'be of as little use in rescuing the Alpine forests as moral strictures have been in preserving good morals' (Kasthofer 1818:13).

Although Kasthofer had been raised in Berne, he was not a forester who promoted the interests of the city at the expense of 'the good people living on the land', as he referred to farmers in the paternalistic style of a development worker. He abandoned the comforts of Berne to move to the Bernese Oberland, where people smelled of the open hearth rather than the fashionable perfumes available in the city. Here he made difficult journeys into the forest and visited farmers, travelling

for extended periods, undeterred even by the discomforts he encountered. For his commitment to his mission and to the local population, he was reproached by his superiors for being ‘too liberal’ and accused of working to promote the interests of the countryside rather than the interests of the government and the city he was supposed to represent (von Erlach, 1944:13).

A ‘developing country’: the Bernese Oberland

By today’s standards, Kasthofer could indeed be regarded as a kind of early development worker. In his first years as District Forester, he devoted himself to seeking technical improvements. In order to conduct research of his own, he purchased Alp Abendberg near Interlaken, where he experimented with, for example, Kashmir goats from the Himalayas. These animals were valued for their fine, soft wool, and were said to browse modestly, causing little damage to the forest.

Kasthofer’s primary interest, however, was trees. He suggested to farmers that they plant ash (*Fraxinus excelsior*) and other deciduous trees, not only in the forest but also along streams and embankments, and in meadows and pastures. He explained that trees, with their extensive root systems and the great surface area of their leaves, were able to make best use of the deeper layers of the soil and to take advantage of sunlight and air above the ground. In addition to that provided by grass, trees would also supply litter, as well as timber, and, above all, leaf fodder. Pressure on the forest would thus be relieved. Moreover, it would be possible to fence off patches where the forest was regenerating naturally. Kasthofer extolled repeatedly the virtues of what he called ‘meadows in the air’.

It took time, however, for the people of the Oberland to overcome their suspicion of the forestry official sent from Berne, and to accept his rather technically oriented suggestions. He later wrote, with obvious disappointment, ‘Confucius said, “He who raises children and plants trees will go to heaven”. Our herdsmen are good at the former, but have little interest in the latter’ (Kasthofer, 1822:24). Many of the trees Kasthofer planted were devoured by goats, and it seems certain that few of the larches that he generously distributed free of charge to farmers grew to maturity, or he would undoubtedly have recorded it.

Kasthofer therefore concentrated his efforts on public forests, which were relatively easy to control, such as the Little Rugen, a hill on the southern edge of Interlaken.

Here he planted larch, and exotic trees such as the North American Weymouth Pine (*Pinus strobus*), Lebanese cedar (*Cedrus libani*), and Austrian black pine (*Pinus nigra*). His goal here was not just to cultivate timber and non-timber forest products, but also to create a recreational forest that could be enjoyed by tourists (Kasthofer, 1851:7). To this end, he began to lay out hiking paths as early as 1815.

Tourism and a boost in agricultural production

The English poet Byron visited the Bernese Oberland in the following year, and his rapturous descriptions of the landscape helped arouse interest in the region and make it attractive to the English. By the early 19th century, England had long been burning its own coal to produce energy (Sieferle, 1990) and was tapping the resources of colonies such as India, which had become important sources of food and raw materials. The development of trade, accompanied by technical and scientific progress, subsequently made it possible for a privileged upper class to engage in leisure travel.

Interlaken simultaneously began to transform itself from a farming village into a tourist centre; boarding houses and hotels were constructed, private rooms became available for rent throughout the town, and wood carving gained a firm footing as an indigenous handicraft.

Agriculture also began to undergo rapid change. The reforms proposed by economic societies in the 18th century and refined by promoters like Karl Kasthofer now began to spread from the lowlands of the Canton of Berne to the farming valleys of the Oberland. Cow sheds were expanded to include troughs for collection of animal urine which contained half of all the nitrogen and which had previously seeped unused into the ground (Pfister, 1990:45). Due to more intense organic fertilisation and the planting of legumes for fodder, both the quality and the quantity of cattle feed were enhanced. Milk production soon doubled, and there was a boom in cheese exports (Pfister, 1990:359). In many places commons which had long served as community grazing land were divided up into private plots and converted to potato fields, which became highly productive with sufficient inputs of fertiliser.

The political landscape was also changing. The Liberals who won in the elections of 1831 provided the Canton of Berne with a new constitution in the same year. This did away with hereditary privilege, guaranteeing equal rights to all citizens, while also removing all restrictions on agriculture, commerce and trade. The

concept of private property, understood as complete individual control over a particular possession, was the guiding principle on which these changes were based. By contrast, traditional forms of communal ownership were perceived as the main obstacle to a free market economy and economic growth.

Karl Kasthofer continually insisted that liberal reforms also had to be extended to the realm of forestry. He urged that forests in which different owners had different rights and interests should be divided up in such a way that each individual could use or improve his own parcel of forest in accordance with his own wishes, 'unhindered by lazy, envious or ignorant fellow owners' (Kasthofer, 1828 II:97). Forests which were not heavily burdened could continue to be managed as communal resources.

Kasthofer did not intend to completely deregulate forestry, however. His goal was to establish a legal framework providing specific guidelines, above all for the use of the forests in the Oberland, as he was well aware that the forests had to be used sustainably in order to preserve their protective function. He envisioned that the implementation of forestry regulations would be overseen by a forestry service, whose officials could also offer direct advice to those who owned and tried to manage forest land. The experts staffing this service would be trained in a special forestry school. The entire operation would be financed by revenues raised through a tax on timber exported by the Canton of Berne.

In 1836 Karl Kasthofer was elected to serve as a minister in the cantonal government. Three years later, his administration secured the passage of a law providing for the separation of forests and pastures. This law allowed for the termination of grazing rights in the forest upon payment of an amount equal to 20 times the annual revenues from these rights. It often took decades for grazing rights to be bought back after termination.

A subsequent law clarified rights to timber use. It allowed for forests to be divided between the state and groups who possessed rights of use, in order to put an end once and for all to the age-old disputes involving the city of Berne and the rural population of the Canton. This change in the regulations affecting ownership of the forest initially had mixed results, however. Privileged members of rural society were still able to make their interests prevail, and to block progress on some of the

legal measures advocated by Kasthofer, such as a competent forest service staffed by qualified foresters.

The law allowing for forest land to be divided among individual beneficiaries caused additional problems. Forest land that became private on this basis was frequently clear-cut, with the timber being sold for cash, either to pay off debts on a farmstead or to take advantage of the new economic liberalism before the political landscape changed once again (Grossmann, 1949:63). Kasthofer's successors eventually came to the conclusion, on the basis of their own experience, that communal ownership was better for the forest than private ownership, not only because good forestry requires planning and action over generations, but also because a minimum surface area must be involved if the forest is to be managed rationally.

Even more far-reaching in terms of its ultimate impact on forest stands and timber quality was the fact that not every family obtained rights of use in the forest, despite the legal guarantee of equal rights to every citizen in the new cantonal constitution. In practice, members of the rural upper class succeeded in exercising the privileges to which they were entitled by birth. Customary rights which had long been accorded to landless individuals – and which had been granted in any case only out of 'good-heartedness' (Stuber, 1993:74) – were now rescinded. Kasthofer had continually warned that the old order must not simply be replaced by 'a new aristocracy of large landowners and people of great wealth' (*ibid.*:111), while the underprivileged who had no legal title were excluded from the forest, thereby abolishing traditional social niches.

In 1835 an organisation of landless citizens reported that the established and once again privileged social class was claiming extravagant amounts of timber for personal use, and additionally enriching themselves by selling it, thereby causing long-term ruin to the forests (Stuber, 1993:113). The fact that timber gained actual monetary value and could be sold by 1830 was due to the general economic change then taking place throughout Europe; timber was a necessary commodity in the expanding economy of the day. At the same time, the denial of social justice for all made thieves of those who had been excluded from the new economic order. Pillaging the forest now occurred on a massive scale, increasing in proportion to the rise in the price of timber (Stuber, 1993:112).

The Alps of yesterday foreshadow the tropics of today

Crews working for timber merchants began to appear in the Oberland in the early 19th century, ‘advancing in an unbroken line with their merciless axes’ (Fankhauser, 1856:132). Sea powers such as France and Holland, which needed enormous amounts of timber for shipbuilding and the construction of harbours, generated great demand: the Rhine and the Rhone rivers were suddenly glutted with shipments of timber.

In the central Alps in the Canton of Valais, clear-cutting took place on a massive scale in response to external demand. Powerful local families such as the Stockalpers, patricians who had controlled important Alpine trade routes for centuries and were among the first to become involved in the Asian spice trade, were able to take advantage of their position to profit from the timber export trade (Hauser, 1968:427). Because the authorities were too timid to bring charges against unrestrained felling, the result, as one local politician later noted, was that the state became the laughing stock of those who divided the forests up among themselves, thereby mortgaging the future to their desire for private profit (Minutes of a meeting of the Swiss Forestry Society, 1865:39 *et. seq.*). Outside concessionaires paid no attention to local forestry regulations. In one case over 1,000 specially selected seed trees and 11,000 younger trees were felled, even though they had not reached the legally established minimum diameter (see K uchli, 1992:98 *et. seq.*).

Timber exports were heatedly debated, and numerous cantonal governments sought to forbid them. Karl Kasthofer repeatedly cautioned that even though it had once been forbidden to export timber, widespread forest destruction had still taken place because timber had no value (Kasthofer, 1833: 33). He believed that as both communes and private individuals reaped greater profits from timber sales, they would take correspondingly better care of their forests (*ibid*: 34), eventually learning to use them sustainably. This prediction was ultimately borne out in the village of Meiringen. In 1853, approximately four decades after Kasthofer’s failed trial with the larch saplings, the citizens of Meiringen planted 20,000 seedlings, including many larches.

Although he would have undoubtedly derived great satisfaction from this development, Karl Kasthofer did not live to see it, for he died the very same year. It is difficult to say whether sustainable forest management would eventually have prevailed in a society that depended on solar energy. Swiss society at the time was

on the verge of being transformed by a new technological development: the railway. This was destined to bring about fundamental change – not only in the economic order, but also in the constellation of forces affecting the forests.

Railways, coal and industrialisation

The construction and operation of railways at first represented another enormous drain on forest resources. Areas newly opened up by the railway were immediately exploited to meet the growing demand for timber in European urban centres. Forests were often wantonly denuded, with increasingly grave consequences such as avalanches and floods. Yet even catastrophes that cost dozens of lives were not enough initially to produce comprehensive measures designed to attack the problem at its roots.

Relief, in fact, first came by rail. Whereas timber was consumed rapidly in the first phase of railway construction, the great quantities of coal eventually brought in by the railway were a beneficial infusion that began to reverse the degradation of Switzerland's forests. The first train arrived in Berne in 1858; two years later coal had already become less expensive on the Bernese energy market than wood, which it rapidly began to replace (Stuber, 1993). Steam-powered ocean-going vessels and the constantly expanding railway network provided the transport infrastructure that made it possible to obtain raw materials, cereals and fertiliser from overseas. The availability of new jobs in cities that developed around railway nodes caused many people to migrate from rural to urban areas – particularly those who belonged to the lower classes.

The fundamental transformation from the age of biologically produced solar energy to the age of coal – i.e. from use of forests on the surface of the earth to exploitation of the 'subterranean forest' – represented a change of which Karl Kasthofer would never have dreamed during his years in Interlaken. The traditional use of forest resources for agricultural purposes now played only a marginal role, in both a social and a geographical sense. The age-old conflicts between urban and rural worlds on the one hand, and the rural elite and the landless on the other, which had intensified in many places when the new regulations governing use of the forest were introduced in Kasthofer's day, began to disappear with the coming of the industrial age and disappeared behind the coal smoke. Pressure on the forest was reduced to the extent that foresters could finally realise their visions of forest management with far less interference.

This sweeping socio-economic transformation also made possible the passage and subsequent enforcement of the Swiss Forestry Act of 1876. That the forests were saved by this law alone is a myth which has frequently distorted views of present-day problems in developing countries. The law of 1876 was a code which contained broad provisions. The principle of ownership of forest land was retained, but the actual powers of the owners themselves were sharply curtailed in the interests of society as a whole – which was understood to include future generations. Tracts of forest land could no longer be broken up, gaps in tree stands had to be closed, and all forms of forest use had to be set down in a forest management plan. Moreover, every tree intended for sale was to be marked by foresters.

The return of the trees

The Swiss forests gradually began to regenerate. Pressured by the age old fears of timber shortages and of natural disasters, forestry officials attempted to accelerate the regeneration process in many places. As of 1860, one million saplings were being supplied annually by the nurseries of the Canton of Berne. Conscious of the need to establish the legitimacy of their new profession, foresters were eager to achieve rapid results. Trees planted neatly in straight rows were a symbol of progress, and were also more likely to be respected and cared for by the population than trees which grew in the disorderly pattern typical of natural regeneration.

Early misjudgments made by foresters, such as the selection of a species that is not appropriate to a particular location, or the cultivation of a single species on a large scale, were brutally exposed by storms, snowfalls and pests. By the beginning of the 20th century, large-scale clear-cutting followed by re-planting had been abandoned in favour of small-scale felling followed by natural regeneration in most parts of Switzerland.

Until 1900, the forestry administration was not very popular with the general public. In remote areas where economic change came slowly, foresters ran the risk of arousing the animosity of the local population: they were occasionally shot at, and in one case were the intended victims of an attempted bombing. In the course of the 20th century, however, they were increasingly accepted in their role as advisers. The social gap between rural and urban areas had narrowed, and forest management assumed an important place in the local and national economy. In addition, timber continued to have a high value and command a good price, thereby

helping to ensure that adequate attention could be given to forest regeneration.

What Kasthofer had long advocated eventually became a reality: many communes discovered that timber revenues were sufficient to finance their entire communal budget. Wood was used as a raw material in a vast array of items and its value remained high until the 1950s. Aside from several forms of extensive agriculture, forestry was the only sector where sustainable resource management was successfully practised and where the output in terms of energy was greater than the input, with no depreciation of capital.

Oil ushers in the modern consumer society

Beginning in the 1950s the age of petroleum opened a new chapter in the history of energy production, as cheap oil brought about a rapid decline in energy prices. Energy-intensive forms of production became the order of the day, while new lifestyles characterised by wanton consumption eventually caused extensive environmental damage (Pfister, 1995:86). The standard of living reached a new high point, the need for physical labour declined, and new forms of leisure and entertainment continued to be developed.

Per capita energy consumption in Switzerland is currently about 15 times greater than it was in Kasthofer's day, while the average amount of massive waste produced annually is 400 kilograms per person. Metropolitan areas, suburban communities, roads and motorways have all expanded on a vast scale, and mass automobile transport has virtually destroyed the cities. Agricultural production now requires an energy input five times higher on average than the energy value of what is eventually harvested in the form of food (Vontobel, 1994:14).

Oil has also altered the classical role of the forest as a source of energy and raw materials. Domestic timber has to compete with steel, concrete and synthetic materials which all are 'subsidised' by low energy costs. Swiss timber (indeed all central European timber) has to compete, in addition, with wood products from countries where highly mechanised, inexpensive methods of clear-cutting and other forms of timber exploitation are still permitted. As a result of the low cost of energy used for industry and transport, products manufactured in these countries are competitive on the world market (Küchli, 1994b).

Nepal: similar basic conflicts to those in the Alps

As in the Alps, the hill forests of Nepal have long been subject to a complicated field of conflicting human forces which are quite similar to the ones in the Alps. Urban centres such as Kathmandu, Gurkha and Pokhara have always demanded substantial amounts of timber for construction and wood for energy. For example, the mounting of the arsenals in Kathmandu, which housed weapons for 45,000 soldiers at the beginning of the 19th century, required enormous amounts of energy. This placed demands on the forest similar to those made by the city of Berne on the Bernese Oberland in Karl Kasthofer's time. Farmers who lived in mining areas had to pay their taxes in the form of charcoal. In addition, timber and fuelwood to fire bricks were not only needed to build the Rana palaces and temples, but continue to be very important for the construction of modern Kathmandu.

The rural population in most parts of the country, on the other hand, continues to be highly dependent on forest products for subsistence – leaves/grass for fodder, litter for compost, other non-timber forest products, fuelwood and timber. Around these traditional products occurs the other main type of conflict, the rural-rural disputes, between households in a village or between different villages.

The urban-rural conflict has long and deeply influenced forest politics in Nepal. Most approaches to solve them have been of European origin and were brought by foresters of European origin, such as the German Dietrich Brandis, to the Indian subcontinent. Until recently they have been spread via the former Imperial Forest College in Dehra Dun, from whence they also arrived in Nepal. Since national unification in the 18th century, increasingly powerful national governments in Kathmandu have, until recently, sought to gain control over the country's forest lands – not only as timber and energy resources, but also as land reserves. During the feudal Rana regime, approximately one-third of the forest land came under *birta* tenure – it was given by the state to individuals as a reward for military service (Talbot and Khadka, 1994).

The collapse of the Rana dynasty in the 1950s wrought huge changes. Kathmandu experienced a phase of intensive growth, and urban pressure on the forest increased. In 1957 the Government of Nepal nationalised all forested land – one of the arguments for this move being to ensure adequate protection and utilisation of the forests for the good of all Nepali people. However, this last country-wide attempt

to gain central control over forest resources also turned out to be unsuccessful. As in the case of the Bernese Oberland, the coming of nationalisation provoked further clear-cutting in some areas. Also, the lack of effective protection, which officially was entirely in the hands of the Department of Forests, was one reason for the high level of encroachment which often occurred in advance of cadastral surveys.

In the 1970s, the decline of forest quality and area became the focus of growing national and international concern. A number of pessimistic reports ultimately were forged into the *Theory of Himalayan Degradation* (Ives and Messerli 1989).

By the mid-1970s it had become clear to many Nepali foresters and their expatriate counterparts that the nation's forest heritage could only be preserved 'together with the local people, not by forcing them to do things against their will' as one Nepali forester put it. This bears a strong resemblance to Kasthofer's views, when he was faced with a similar situation 150 years previously. The National Forestry Plan of 1976 provided the legal basis for establishing community managed forest lands (Panchayat Forests and Panchayat Protected Forests), leasehold forest and private forests. A major vehicle for implementing the new forest policy was the Community Forestry Development Project (CFDP), which had a US\$ 25 million budget for its first five years. The aim of the CFDP was rapid reforestation of the denuded hills, with priority given to close collaboration between the forest service and the local population.

The CFDP fell far short of attaining its goals. Compelled by visions of the hills eroding away, the international donor community pressed for quick results in the form of intensive reforestation work. The forest service had little time to establish a sound relationship with the local population, and most negotiations took place with panchayat representatives, who did not represent the interests of the majority, and especially not those of women.

The fact that the forests in the hills remained greener than predicted was largely due to traditional management systems, or newly developed local initiatives which remained in place even in the districts adjacent to Kathmandu valley, and largely hidden to the eyes of international experts. It was the recognition of this phenomenon that led to the conclusion that these practices, if encouraged and supported by central authorities, could provide the foundation for a sustainable utilisation and ultimately the protection of the forest resources in the hills.

For a long time Nepal did not have social and political conditions that were conducive to such local autonomy. Political conditions only started to become more favourable with the popular uprising of 1990. The Constitution of the same year states the fundamental economic objective of the State as being,

‘to transform the national economy into an independent and self-reliant system by preventing the available resources and means of the country from being concentrated within a limited section of the society, by making arrangements for the equitable distribution of economic gains on the basis of social justice, by making such provisions as will prevent economic exploitation of any class or individual...’ (quoted in Talbott and Khadka, 1994).

The Eighth Five Year Plan (1992 – 1997) commits the government to,

‘engaging the people themselves as the centre and effective source of all actions and decision making’.

In trying to reduce bureaucratic and administrative obstacles to the new bottom-up approach, the Plan advocates adopting policies that will ‘be made more liberal, simple, and clear’.

Decentralisation is also the guiding principle of the Forestry Act of 1993, which is considered one of the most innovative and progressive of its kind in the world. This law stipulates that control of Nepal’s hill forests – and not merely of tracts with virtually no trees as in the first phases of the CFDP – be transferred to the local population, provided that they organise themselves into user groups. These groups will also receive revenues from forest products.

A community of users in this context no longer refers to villages or even to entire *panchayats*, but to small user groups who have always managed more or less clearly defined tracts of local forest land. Though the forest technically remains the property of the state, the new management plan, which the forest service must elaborate in co-operation with each user group, guarantees local populations the right of use over the long term. Decisions are to be made jointly by all individuals who enjoy the right of use – especially women – and revenues are to be shared equally. Technically, the main focus of the new law is no longer on afforestation but on management of the still available natural forests. New plantations will play an important role only on degraded or eroded soil, in places where there are no trees, or where desirable species no longer grow naturally.

The principles of the Forestry Act of 1993 may be compared with the liberal constitution drawn up in 1831 in the Canton of Berne, when it was required to deal with a similar situation. Similarly, they stand in diametrical opposition to long-established gender roles, the hierarchical social structure of a cast society, and the country's highly centralised form of government. It is therefore unreasonable to expect changes to occur overnight, when it took decades of perseverance to implement a comparable process in the Alps.

Accelerating socio-economic change

As shown with the example of the Bernese Oberland, the present-day situation of the forests in central Europe has been greatly furthered by the overall socio-economic change, which was financed through coal energy. Are there similar current developments which will allow the Nepalese forest a comparable release? Certain present-day conditions in Nepal bear similarities with developments in the Alps at the time the railway was introduced – although of course there are also many differences.

To focus first on the similarities, the growing road transport network is breaking up local patterns of commerce, serving as a means of spreading new social values, and making the rural population more mobile. This is the point at which industrial development began in the Alps, offering a new life to many of the landless. Initial signs of comparable development can be seen today in the Tarai and in Kathmandu (Banskota, 1989:5), although it is difficult to know what is due to productive forces and what is a consequence of development aid, directly or indirectly.

Many changes have also occurred in agriculture over the past few decades: the potato, which yields a harvest ten times greater than barley or buckwheat, is now widely cultivated. More and more animals, above all water buffaloes, are being kept in stalls, allowing the more efficient use of dung (although a good part of their urine, which contains high amounts of nitrogen, still seeps into the ground without helping to fertilise the soil). There are still other parallels to development in the Alps. Nepal is now visited by over 300,000 tourists annually. 250,000 people are currently employed in the carpet manufacturing industry, which was initiated in Tibetan refugee camps in the 1960s by the Swiss Development Cooperation. Yet working conditions and wages for these people are often no better than those in Europe at the start of the industrial age.

By contrast with 19th century changes that affected the Alps, events in Nepal are occurring on a much more condensed timescale. The most noticeable developments of the 1990s are the rapid growth of urban centres and the increase in jobs. Many rural people have pulled up their roots in search of what they hope will be a better life, working at least on a seasonal basis in the Kathmandu Valley or emigrating to India. In particular, it is the men from underprivileged rural households who seek jobs, as they are unable to significantly increase the productivity of their undersized holdings, despite considerable inputs of labour and compost (Malla, 1992).

Migration of this sort has an immediate effect on land use. In many places marginal agricultural soils lie fallow owing to the lack of an adequate household labour force during seed and harvest times. At the same time, the money earned by a family member with a job is now sometimes used to purchase food. The emerging new trends have far-reaching implications on trees, forests and their utilisation. For centuries, fodder, leaf-litter and fuelwood were the main forest products. With the accelerated urbanisation, however, the demand for commercial timber is steadily increasing. In the growth centres of Dolakha, fuelwood prices have doubled since 1990, and the demand for construction materials, timber included, is soaring (Infras, 1995). A look at Kabhre district, where due to its vicinity to Kathmandu, market influences began to be felt years ago, reveals further possible trends. Already in 1990 in Kabhre, there were more than 100 wood processing enterprises, and some people had responded to the rapidly growing market by growing trees on their private land (Malla, 1992).

Nepal today is already a net importer of timber, in spite of substantial over-exploitation in the Tarai (its lowland plain). Nepal's timber requirements in 2001 are calculated at 3.1 million m³, with a local production of 1 million m³ and a corresponding deficit of more than 2 million m³ (Infras, 1995). It seems only a matter of time before hill regions in which there are natural forests with a good potential will be tapped for timber. This could be a great opportunity – but also harbours many dangers.

A similar situation in the Alps during the last century ushered in a particularly difficult, indeed shameful, phase in the region's history. For it was at this time that the rural elite began to reassert their long-claimed rights and attempted to drive underprivileged classes out of the forest, thereby intensifying rural conflicts over resource use. As the price of timber continues to rise, will this also be a danger in Nepal? Attempts might be made by those in positions of political and economic

power within user groups to focus production entirely on revenue-producing trees. Such an approach would run counter to the interests of those people who still lead traditional lives, and for whom non-timber forest products still play an important economic role. This includes a large proportion of women, as well as lower castes and the elderly.

The demand for wood can also represent an opportunity in well organised user groups where every man and woman is conscious of his or her rights, duties and options. After all, these user groups have a dual aim: to optimise the management of the forests allotted to them, and to improve the well-being of their individual members. Selling commercial timber could enhance communal revenues, while local processing operations could create jobs in rural areas, thereby diminishing the rural exodus.

Both the pace and the possible extent of such development are unclear at present. Two things, however, are certain. First, for many Nepali people, agriculture and traditional ways of using forest resources will continue to play a major role well into the next century, and, second, as in Swiss history, the commitment and the performance of the forest service will continue to be of decisive importance.

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