

# Doodhatoli

## Greening music of the hills

It is almost as if, the hills never go to sleep, the sun always keeps vigil. So much like the tall frame of the Himalayas. A climatic check post, rising like a giant for the entire country stretched out at its feet. And the people, living in its lap, among the high reaches of pristine nature, almost like custodians of the revered land. The hill people have from time immemorial, been regarded as a hardy lot. It is natural to conjure up images of tall framed, strong bodies, something in keeping with the giant mountains in the background. Still most often then not, the people from the hills are short framed. But looks are again, most often then not misleading. For the short stature is a perfect foil to the long sightedness of the giant vision, that makes the people of the Himalayas worthy of tribute.

The success of glimmering Ghamtapus is not something that happened overnight but is a part of a bigger reality. The reality of the people of Doodhatoli. Just as Doodhatoli is a part in the bigger plan of things, of the great Himalayas. But for the people of Doodhatoli, it is this mountain which stands high at their doorstep. It is the mountain that represents the Himalaya for them. And for the devotee, even the reflection of the 'Devta' (God) is sacred.

Doodhatoli, the land of milk, the vessel of brimming abundance. The thick forests of the region, have been famous as summer pasture grounds to thousands of cattle. Renowned for the grass that never failed even in the driest of years. Considered to be the only mountain range in the Himalayan zone, that makes 'Bugyals' or pasturelands at its height. The highest mountain peak of the Doodhatoli range is close to 11000 ft. above sea-level while Bugyals are generally found at heights beyond 11000. Covered in snow for six months of the year. It seems the threshold of a land, locked in the mysteries of time. Hibernating under the sheets of ice, that veil the landscape in cold winter months but come Chait-Baisakh and the ground is a riot with colours. The hues and tints of green at this height are a painter's delight, the colours of life, nourish the hungry eyes in all its splendour and the storehouse of nature, unfolds its largesse. Too much food for thought. And to put it simply, the rested land springs forth with the juices and nectar of succulent fodder and grasses for the grazing cattle. The studied pattern of nature's clock may still surprise with all its bounty !

Still Doodhatoli is a small part of the Himalayan largesse. The Himalayan expanse in our country runs deep into almost four states. The state of Uttar Pradesh (U.P.), is the single largest geographical unit of India. Divided into more than 18 districts. The mountainous region of Uttar Pradesh is broadly referred to as 'Uttarakhand' (Uttara=north, Khand=region), divided into two zones or 'Mandals' of Kumaon and Garhwal. The Kumaon Mandal forms the districts of Pithoragarh, Bageshwar, Almora, Nainital, Udham Singh Nagar and Champawat. In the Garhwal zone lie the districts of Chamoli, Rudraprayag, Uttarkashi, Dehradun, Tehri and Pauri.

The district of Pauri is home to the Doodhatoli ranges, considered the most massive feature of the mountains in Central Garhwal. Cloaked white in appearance, it forms the most gently sloping hillsides, in the whole of Garhwal. The vast forests of the Doodhatoli stretch in over 300 sq. kms. The dense vegetation offers 'Chir' (Pine) and 'Banj' (Oak) forests in the lower slopes, yielding to harder Oak species of 'Tilonj' and 'Kharsu' on the middle reaches and 'Deodars' (Himalayan Cedar) on the higher ridges. Still the mountain is best known, as the summer pasture for the cattle of the surrounding districts, extending well beyond the boundaries of Pauri into the districts of Chamoli and Almora; it undoubtedly forms the largest forest cover in U.P. The tall peaks of the Doodhatoli range form an able watershed, for most of our crucial freshwater resources. Containing the headwaters of rivers Ramganga, Beenuganga and the two branches of river Nayar, all merging into the womb of the Ganges in the plains.

The Doodhatoli forest division in the Pauri district, extends largely into the two regions of Chauthan and Radh. The Chauthan 'Patti' (tract of land) comprises of a group of 62 villages. The region of Ufrainkhal is part of this Chauthan patti. Balanced high in the Doodhatoli mountains at a height of 6000 ft. above sea-level,

The pervasive degradation of Doodhatoli also continued, despite the independence of our country. For the mountain hillsides, represented virtual goldmines for a developing nation. Its booty too valuable and crucial, for a developing economy. And except for perhaps the religious sentiments that the Himalayas arouse, the essence of the mountains remained, but isolated on our mental margins.

it is the land of open vistas, unmarked horizons, the land of rising mists and falling dews. Evoking strong emotions, inspired in the backdrop of the majestic Himalayas, standing tall as the universal symbols of human aspiration. It is no surprise that the mountains weave a spiritual spell on all of those, who choose to gaze at the monoliths of nature. It is a general belief that the Himalayas embody the 'Isht Swaroop' (Isht=respect, revere; Swaroop=form, appearance) or the picture of respect and reverence that inspires the spiritual sentiment of human disposition. And especially the 'darshan' (sight, view) of the Himalayas from Uttarakhand, the view of the holy hills and the sacred dhams, plucks at our spiritual chords. Moving not the 'shringar' or romantic feeling in our subconscious but the 'adhyatmik' the spiritual, to uplift our souls towards enlightening thoughts. Of not just our own people, but even those who come to visit from foreign lands. Untouched by the concept of spirituality of the East.

One famous anecdote dates back to the '50's, when an American chief judge visited the region of Ranikhet and sighting the Himalayas from the foothills, was spiritually so moved that he was compelled to encapsulate the experience in the form of a short story. The 'Basket Girl' became a famous tale of a foreigner's spiritual inspiration. Where the head spontaneously bows in homage and the spirit soars, almost uplifted towards the universal symbols of human aspiration, to bask in its glory.

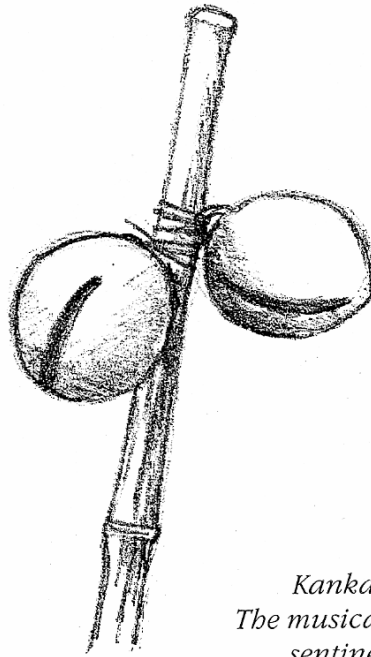
But the land which inspires such noble emotions, appearing like a giant edifice

of timeless phenomenon. As if untouched, invincible. Conjuring up images of picture perfect paradise, is nonetheless as vulnerable to the ravages of time and the march of civilisations, as the other elements of nature's diversity.

The increasing maze of urbanisation and industrialisation has left much of the human majority almost mentally disconnected from the sources of their sustenance, making them usually indifferent to these sources. Further spawned by the dictates of economic development policies, the industries have transformed mountains into steep storehouses of timber, water, hydroelectricity and minerals for export to the plains. Much of the natural assets have been the target of intensive resource extraction. This process of exploitation has been far entrenched into the annals of time. But large scale deforestation activities, gained momentum with the colonial intent of foreign rule, to yoke the country in a singular mould.

The mountains have represented, daunting challenge to centralised administration and jurisdiction. Biologically, their high diversity, characteristic of mountain ecosystems, is the combined effect of rapid changes in altitude, climate, soil and vegetation over very short distances. The mountains represent prolific concentrations of endemism or species found nowhere else. And culturally also, most of the mountain people, are more of ethnic minorities, outside the dominant cultures of the plains. Still the policy of extraction continued, the natural assets of the mountains, too lucrative to be lost despite their steepness, isolation or marginality.

The British records state that the forests, from time immemorial, have been considered the property of the sovereign. And this policy of supreme ownership, coupled with the inroads made by the colonial rulers into the remotest corners of the country, had the mountains largely conquered. The wood of the virginal forest areas of the Garhwal region, had been a stronghold of three principal items of export to the plains. The 'Kath' (timber), 'Bans' (bamboo) and 'Katha' (catechu). In earlier times, the rulers levied minor forest dues, which accrued to the 'zamindar' (landlords) but with the advent of the British rule, much of the forest and pasturage dues, got transferred into bureaucratic control or the Collectors or Forest Superintendents. But the march of the government increased, with the network of roads and communication, snaking into the peaks and summits of these highlands. So did the management of forests change hands, with the Garhwal forests transferred into the forest department in 1868. In 1879, they were declared reserved forests. Though they guaranteed the hill people of their customary land rights, of free grazing for a limited number of cattle, cutting grass for home consumption and collecting dry and fallen wood for fuel and agricultural implements. In effect, the



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mountains over the period of time, became net exporters to the plains. With the once lush, green landscape reduced to stark, naked hillsides and the dense forests becoming easy fodder for the paper mills and timber industries of the plains.

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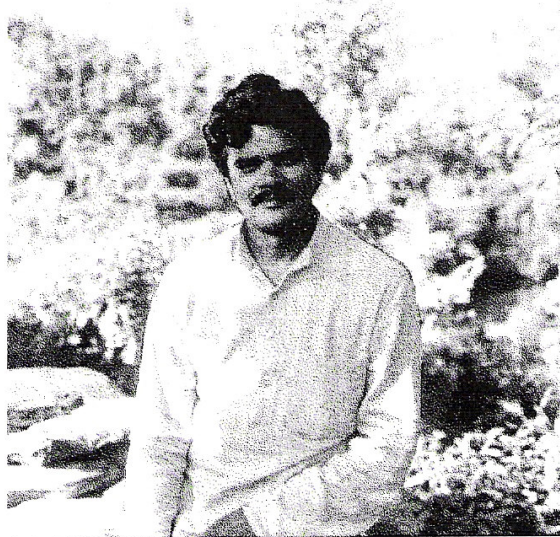
But in the region of Garhwal, the symbiosis, the deep interdependence between the mountain people and their natural habitat, was too far rooted in the rhythm of life, that despite the onslaught of commercialisation and industrialisation and the ensuing impoverishment, the mountain communities have strived to be custodians of their faith. This conflict between the vested interests of governmental economic stakes and the culture of mountain people, found effective expression in the 'Chipko' (hug the tree) movement, which struck root in the Chamoli district of the Garhwal Himalayas in the early '70's. A strong grassroots campaign of the hill people, emerged to protect their forests from extensive logging. The villagers realised, that the increasing local floods were due to widespread commercial clearing of hillside forests. The forests under the preserve of the forest department, had become virtual playgrounds for the rich contractor lobbies, severed like sacrificial lambs at the call of the highest bidder. While access of the mountain people was restricted under the guise of reservation and distinction, same rules and policies got easily flouted, when money changed hands. Chipko spearheaded an emotional response of the people of the hills, to prevent the ecological disintegration of their lands and saw the village women take on the cudgels of change, to launch a non-violent movement, to preserve access to local forests and in effect ensure their forests against illegal destruction.

Shri Sacchidananda Bharati, a young lad who had been witness to the rampant and agonizing destruction of his homeland, was then a student at the Gopeshwar College (Gopeshwar was at the centre of the Chamoli district and the hotbed of Chipko movement). The outreach of the non-violent movement had extended beyond the arms of women activists and infused the youth of the region in equally revolutionary fervour. The Chipko movement saw Bharati, deeply embroiled in the new form of struggle, that has come to be regarded as one of the foremost environmental movements of the country.

Enrolled as a student of Science in the Gopeshwar University, Chipko lent a unique opportunity to the young mind, to interact with the realities of his immediate environment. In '74, he was instrumental in forming a Saturday club of his fellow students, serving as an open platform for discussion, debate and generating awareness about environmental and developmental issues. But not to rest easy within the confines of college life, he actively participated in the Chipko campaign. Often travelling long distances in the adjoining villages and far-flung hill districts, along with his young college friends and Chipko activists. He helped form many 'Yuva Nirman Samitis' or youth organisations, committed to the task of saving and planting trees. He was also the force behind, the building of the 'Uttarakhand Sangharsh Vahini', a volatile students forum, comprising of young college students, of the entire Uttarakhand region. In '76, he formed 'Daliyon Ka Daghra' (literally

meaning friends of trees), an informal youth group, which played an important role in spreading the Chipko word and highlighting the need for environmental conservation and networking for people's interests. Many a times, the team of young lads, would travel to neighbouring villages around the Gopeshwar town. Interact with the village people in an evening meeting and raise the slogan of environmental protection in an early morning 'Prabhat Pheri' (Prabhat=morning, Pheri=procession) with the people. But the spirit of activism was not just limited to oral vocalisation of the cause. It was followed by voluntary physical labour or Shramdaan. Planting of trees, digging of earthen pits or protection walls. And this enthusiasm was not deterred, by the long walks in the hilly terrain to reach into even remote villages. This initiated Bharatiji into the realm of local interaction, planning and participatory action.

With this experience of committed action and fearless initiative, Bharatiji returned to his village in Ufrainkhal, in the Pauri district. Ufrainkhal in the hill dialect finds meaning in 'Ufrain' denoting 'uppar' or up, upper and 'khal' implying a small body of water. 'Chaals' or 'Khals' in the hills, are synonyms for small ponds or lakes or reservoirs, similar to small talaabs in the plains. Ufrainkhal is an extension of the main village of Gadhkharak, located almost 2 kms. downhill from the motor road, which serpentine along the Doodhatoli mountain curves and tracks. Ufrainkhal in the early years of the '80's, was a small cluster of isolated homes and some tea shops, along the motor head, found aplenty in the hills. Bharatiji remembers the Khal, which at one time dotted the head of Gadhkharak. But the intervening years had seen much changes in the landscape. The Khal no longer existed but the name stayed.



*Sacchidananda Bharati*

With the building of the primary school and Inter college at Ufrainkhal and the construction of the motor road, the small cluster of few houses had grown manifold. Today, Ufrainkhal is almost like a small hill village beside the motor head. But for the people, residing in the scores of villages lining the Doodhatoli hillsides, the identification of home goes beyond the name of one's village to the large expanse of the mountain of Doodhatoli, which supports the various villages nestled in its lap. Doodhatoli is symbolic of the lifeline that sustains the agro-pastoral community. The land of bugyals which supported the transhumance lifestyle of the people. The seasonal movements of livestock from lower to upper grasslands. The undulating meadows and rich pasture lands of the bugyals, flourished with fodder and grass for the foraging cattle, from the immediate and far areas to graze upon even, in the most driest of years. ( Even today there are about 500 'Kharaks', forest

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'goshalas' or cattle sheds, where more than 25,000 cows and buffaloes find shelter in the summer months.)

Thus Doodhatoli has been equated with the abundance of milk, that the grazing cattle guaranteed. But post-independence saw the mountains almost milked like a bovine, dry ! Doodhatoli too had been ensnared in the net of illegal logging. In '78, a large tract of Doodhatoli's virgin forests came under the auction bidding. The forest department sealed 6000 'Ragha' trees (the Himalayan variety of Silver Fir), found between 7500 ft. and 11000 ft., in large numbers on the summits of Doodhatoli peaks. These trees attain a height of 120 ft. with a wide girth of 15 ft. and the wood of these tall trees is considered profitable for its valuable timber.

The dense growth of these forests in the past had been assured, owing to their isolation and endemism to the high altitudes thus making them largely inaccessible and perhaps economically also unviable, due to the difficulty in their transportation. But the increasing demands and rampant deforestation in the lower slopes had pushed the monopolisers, up the narrow mountain paths. Much of the hillsides in the villages around Gadhkharak and Ufrainkhal, had been swept clean of their green cover. The cleared patches of indigenous species, had been largely replaced by government sponsored Pine clusters.

But before the Pine came of age, the Ragha trees in the high reaches became victims. The barren lower slopes of Doodhatoli, made way for exploitation at the increasing heights. It was perhaps the first time, that the forest department had made such tall claims on the Doodhatoli hills but this time round, the people of Doodhatoli were unwilling to take the bait without a fight. The wave of Chipko movement had created ripples in the entire Uttarakhand region, pitting the wood hungry contractor lobbies against the concerns of the natural and human communities of the mountains.

And the people of Doodhatoli had received a boost, with the return of a determined son, Bharatiji into his homeland in early '79. He was instrumental in shaping the rising voices of dissent and reaching the public opinion to the highest offices. Establishing contact and constant interaction, within the surrounding villages of Ufrainkhal, Bharatiji kept the ideals and spirit of Chipko alive, within his own region.

And in '80, when the forest officials arrived to collect their booty, the anger and the resentment of the village people took all by surprise. So vociferous and fearless was the people's initiative, that the forest officials were forced to lay down their arms and stall all work. The bureaucratic lords were cornered into a dialogue with the people. The forest officials, who in the past had carried out random, open onslaught of the hillside forests without any answerability or accountability to the people, were learning a few lessons in dignity and service. The youth, the women and the elders, had all come to the fore in the fight, strengthened by various youth groups of 'Daliyon Ka Daghra'. And perhaps for the first time in the history of Doodhatoli, the forest officials had to agree to visit the sealed-off forest site in the company of the people, the victimised communities, native to the region. A representative team of the people, headed by Bharatiji accompanied the forest officials and the visit to the proposed site of logging, revealed that the sealed lot was of young, green, healthy trees, in their early prime, too young to be brought under the axe. This misinterpretation of facts, had for long been the mainstay of the forest

mafia and the illegal smuggling activities, which had tarnished the image of the forest department in the hills. It was not uncommon to find, that though on paper they recorded the clearing of an old forest patch, in reality, healthy trees in their prime, were smuggled out. But this joint visit ensured, that the green Raha trees were to be spared and only the dry, diseased or old, fallen trees were to be cleared. In all, the number of 6000 trees was reduced to 700 ! In addition, many 'Kharaks' of cattle herders, not belonging to the region were also outlawed, who in the past had managed to gain entry in connivance with the forest guards.

This small success laid the foundation for big changes. Infusing the people in a spirit of confidence, belief in their rights and the importance of participatory action. Bharatiji had been successful in reinforcing the inherent self-reliance of the people, by strengthening and not subverting their community traditions and institutions. The victory of the people had initiated the move for local dialogue and concerted efforts to safeguard the interests, the livelihoods and the entire life-support systems of the people.

The mountain ecosystems and the mountain communities are subject to unique vulnerabilities, stemming from the same characteristics that lead the external forces to circumvent them; their steepness, isolation and marginality. These vulnerabilities, expose mountain communities to pervasive degradation in the rapid erosion of the resilience of their environment and thus the resilience of the livelihoods within them. The inherent interdependence, the complexity of the human and natural communities, is thus often lost.

The lifestyles and the life-patterns of the mountain people, has been in forging symbiotic links and livelihoods of mutual sustenance. For them, the mountains are not symbolic of something unmoving, unmovable as immutable but dynamic, ever changing and vulnerable ecosystems, in need of as much care and nourishment, as the human community.

For much of the exploiters lobby, the mountains in the so called real world of commerce and politics, serve as a kind of, out of focus backdrop for more important agendas. Much too much, on the margins of consciousness, to be able to comprehend anything beyond the immediate gains. These gaps in comprehension, in vision, sensitivity and sensibility is the bane of much of our modern world view, which has been fundamental in the artificial compartmentalization of knowledge into scientific disciplines and of economies into sectors. (viz. the national interest vs. regional interest or the people who gain and those who lose). This segmentation of knowledge has tended to discourage any integrated understanding of complex mountain ecosystems, in which geological, meteorological, biological, cultural and

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But this picture of self-sufficiency had become scarce. Prior to colonial rule and even much later till the early years of independence, the people of Doodhatoli had been dependent on the outside world just for salt. And that need again, was not fulfilled by the Indian plains but by the high passes of the Indo-China border. Salt in most Himalayan villages, was an item of barter and local trade between the merchants of the two countries.

economic phenomena are too interdependent, to be studied or measured in isolation.

Often critical linkages between upper and lower watersheds, mountain forests and grasslands and upland and lowland communities have been ignored. This ignorance has helped to perpetuate the popular myth that mountain ecosystems exist only above treeline. But mountains are not simply steeper or higher versions, of same ecosystems that occur in the flatlands but are distinctive systems providing uniquely valuable resources—resources that are, because of our unsustainable exploitation of them, also threatened.

But for the people, who had for long been the victims of lopsided government policies and their forests, pawns in the development games, the winds of change promised a fresh breath of life.

Curbing deforestation was one aspect of the fight, the real challenge lay in reviving the lost process of regeneration and restoring the blanket of green on the bare hillsides, involving active participation of the people. In the spirit of triumph, the people were motivated to initiate the aspirited endeavours of afforestation. The atmosphere was ripe for honing the empathy of the tempered

forest official lobby and the heartfelt need and concern of the people. The reality of co-existence and mutual benefit, was conducive for the launching of the first major joint afforestation activity of the people and the government lobbies. The destructors had joined hands with the nurturers, to become saviours of Doodhatoli.

In the pre-monsoon season of '80, the ideal afforestation period, more than 50,000 young saplings of indigenous species were planted in the catchment area of the native river Pasol, the tributary of the Nayar river, in the villages of Gadkharak, Bhatbo, Kundanpur, Ukhliu and Kafalgaon.

In the meantime, Bharatiji had also taken on the responsibility as a teacher in the local Inter college, (an intermediate school) in Ufrainkhal. His interaction with the teachers, the imparters of knowledge and the students, the receiving, perceptive young minds, was a meeting of right timing. The new generation was in the process of being prepared, to take on the mantle of people's struggle. The seed of people's crusade was ready to be sown on fresh minds, a new force was in the making.

On 26 July, '80, an environmental camp of three days was organised by the Inter college, Ufrainkhal in which 150 people, young and old from the neighbouring villages participated. Actively cooperating in the spirit of mutual concern and fraternity. It became the forum of free exchange of ideas, comprehension, information to bring together, the people of Doodhatoli, for years of strife in future.

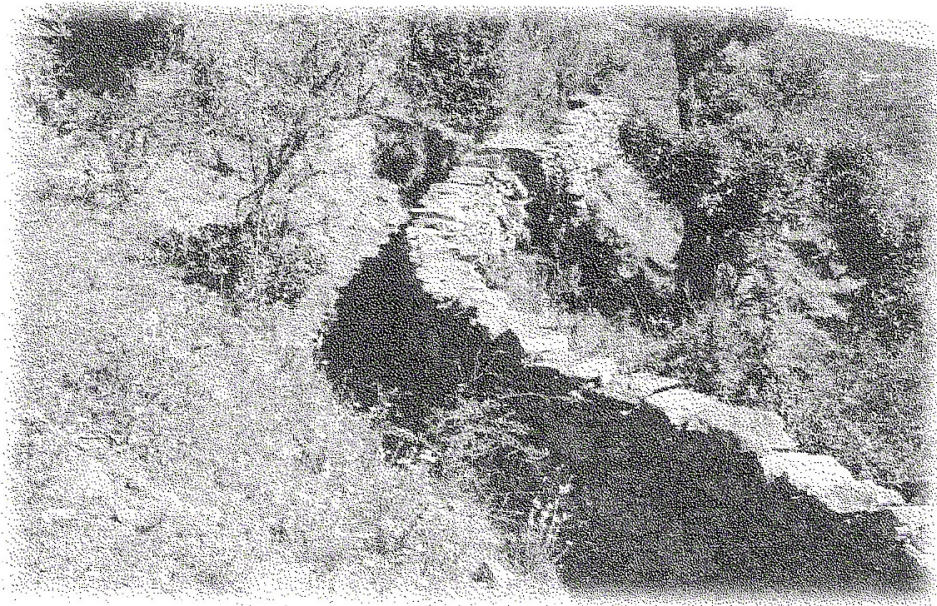
Facilitated by the people's commitment for 'Rachnatmak' or creative and constructive mandate. This camp saw the formation of a people's organisation



called the 'Doodhatoli Lok Vikas Sansthan' (Doodhatoli People's Development Organisation), a humble effort of the people named after their mountain, Doodhatoli, as a tribute to conserve and safeguard their benefactor. (The Doodhatoli Lok Vikas Sansthan was formerly registered in 1982).

But with the vulnerability of Doodhatoli, the abundance in the basin of milk had been leaking. The life fabric of the people was coming apart at the seams, with the degradation of their life-support systems. The livelihoods and the lifestyles of the hill people, is a study in the time tested mountain farming practices and self-reliant and self-sufficient economic framework. Though most mountain economies had suffered with the accessibility of roads and communication, linking remote high reaches to the low lying plains and had brought in its wake, the withering away of small-scale barter of farm surpluses, to trade in a few commercial crops demanded by mass markets. The region of Doodhatoli had fortunately survived the onslaught of modern market forces. Perhaps saved by its steepness, isolation and marginality. Though, had suffered in its becoming accessible to the sawing machines.

The mountain societies, had existed for generations as sophisticated agrarian societies. In delicately balanced relationships with their hazard prone environments, they had relied on complex strategies for deriving sustenance from their



*The Great Walls*

sloping patches of land. From multi-cropping agriculture to seasonal movements of livestock between lower and upper grasslands, from villages to 'Kharaks' in the forests and the high altitude 'Bugyals' in summer. Thus, the people of Doodhatoli had survived on a closely linked agro-pastoral lifestyle.

The people of Doodhatoli, had been practitioners of indigenous agricultural systems, aimed at sustaining the long term productivity of their lands, for local

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consumption and not short term maximisation of yields for sale. And though in the contemporary jargon, this may be indicative of subsistence farming patterns, what needs to be acknowledged and appreciated is that, since mountains are often comprised of narrow altitudinal belts of complex ecosystems, successful mountain agriculture requires much higher level of risk management than is required in less diverse lowland systems.

But this picture of self-sufficiency had become scarce. Prior to colonial rule and even much later till the early years of independence, the people of Doodhatoli had been dependent on the outside world just for salt. And that need again, was not fulfilled by the Indian plains but by the high passes of the Indo-China border. Salt in most Himalayan villages, was an item of barter and local trade between the merchants of the two countries. In the intervening years, first the natural assets of the mountains had moved out of the high reaches. (Accessibility had only fostered exploitation and monopolisation.) But in the other spheres of development, life in the hills was too remote, too isolated to be linked to the mainstream. Be it services of health or education or even employment facilities. The promise of an independent nation had sought to develop its plains, fed on the fruits of the hills but the needs of the mountain people still remained on the margins of its consciousness, on the fringes of the nation's reality.

The highlands had provided the nation with many a hardy soldiers but most of our economists and social scientists, would not think twice, to report the problem of high rate of migration in the hills. It is surprising that the governments, rest easy on their conscience, with the high rate of migration of the hill's natural resources but the movement of human resources is a 'migration problem'! This migration is not largely out of choice but more out of necessity. Increased crowding on the shrinking resource base has led to out-migration, mostly of young men to the plains for cash producing jobs, especially during the off-farming season.

It is quite a contradiction, that the highlands which feed large parts of lowlands, has but little to offer to its own people ! The struggle of the people of Doodhatoli is not just a part of environmental concerns but finds its essence in the subtle overtones of human needs. The interdependence of human and natural communities. The threat to the environmental resilience of the mountains, is not just a threat to the resilience of the livelihoods within it, but also a claim on the resilience of the people, the human fibre of individual dignity, integrity and self-respect of the mountain communities.

And this outmigration of the able-bodied youth has yoked the women of the hills into a life-cycle, that engages them in, significantly longer hours of work than the women of the plains. Life in the hills is tough. It is the women of the hills who play a major role in keeping the family and the hearth together, as most men are out of the villages, working in the cities close by or far away in the plains. It is the women who keep the home fires burning. From the farming activities, tending to the feilds, looking after the cattle, collection of fuel and fodder and tending to the young and old. It is not surprising to find many villages, comprising of just children, elders and women, devoid of any young men. It is a life-fabric revolving around the potential, capability and endless endeavours of the hill women.

In the shrinking resource base of the mountains and the receding forest line of Doodhatoli, many villages like Gadkharak, Ufrankhal had not only lost their

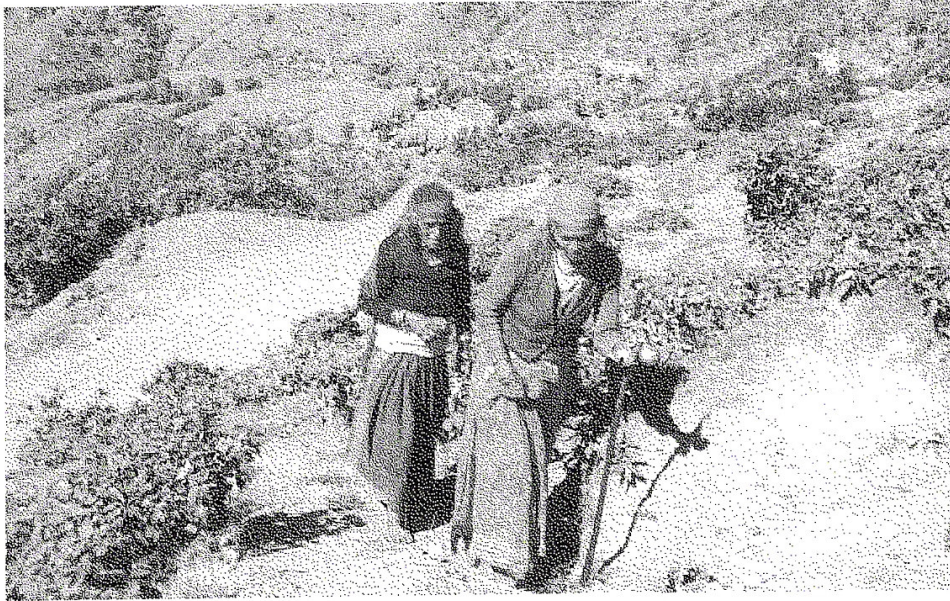
surrounding village forest and thus hungered for their daily fuel and fodder needs, but had also come under the direct attack of the mountain wildlife. The large scale deforestation of the mountain hills had displaced not just the flora but also the fauna, from the deep recesses of their natural habitat. As the forests grew incapable to meet the food needs of the wild animals, they had started to enter the village limits, into areas of human habitation and wreck havoc on the farmlands. Destroying the grain stocks or preying upon the smaller cattle heads, carrying away goats or sheep at night. In earlier times, the bounty of the forests had assured adequate fuel and fodder resources for the people and game for the wildlife but in the early '80's, most of the villages had not only to deal with scarce fuel and fodder resources but also the growing menace of wild animals. Cases of man eating tigers were becoming common.

This recurring hardship became the focus of the Doodhatoli Lok Vikas Sansthan's activities and the strategy employed, brought the women strength to the fore. Concerted effort required active cooperation and organisation of the people. And the strength of the people lies in the strength of the women of the hills. The women of the villages readily came forward to shoulder the responsibility of change, starting with the formation of 'Mahila Mangal Dal's' or women collectives.

The women of the region, have been the custodians of immaculate knowledge and wisdom of the indigenous species of plants and trees which needed to be planted, to meet their fuel and fodder needs. And to safeguard the green cover from the animal menace, it was collectively decided, that stone protection walls were to be built between the forest line and the agricultural fields, on the band of 100-200m. of uncultivated land, as a security net surrounding the farm lands of the village. This obstructed the entry of the wild beasts into the cultivated fields. In Daera village, which was severely in the grip of animal fear, a stone protection wall of 9kms. in length with a height of 2m. and a width of 50 cm., was built on the strip of uncultivated land between the forest line and the last outpost of the village farm lands. Along the wall, indigenous species of trees were planted to regenerate the lost forest cover. The wall proved to protect the village lands against the entry of wild animals while the regenerated trees supplemented the fuel and fodder needs of the village.

But the human endeavours required monetary support to nurture the impoverished land. Though the local forest departments had been supportive in supplying young saplings, still most of these species were unsuitable for the climatic conditions of the high altitudes. Brought from far flung areas, these tender saplings had poor survival rate, till they reached the mountain forest nurseries. The village people were keen to propagate the indigenous species, home to the mountain climate and best suited to meet their fuel and fodder needs. The breakthrough came, with the Indian forest ministry extending funds, to help establish a nursery of indigenous mountain vegetation species. Afforestation activities found new roots and Gadhkharak became the fertile ground of people's efforts and dreams.

Gadhkharak is a small village, balanced precariously within one of the rolling slopes of the Doodhatoli range. Perched high at a height of about 6000 ft; it lies about 2kms. downhill from the motor head at Ufrainkhal. (In effect Ufrainkhal village is more of a sub-village at the vertical head of Gadhkharak). The cluster of 20 households had been residents of Gadhkharak, for generations. Home to



*The musical notes of conservation : Kbankar*

Bharatiji's childhood. The lands of Gadhkharak are bordered by the small river of 'Pasol' (a tributary of river Nayar), snaking through in the valley at its feet and covered by the village forests at its head. Interspersed between the village settlement and the river, stretch out the terraced farms.

The people of the village recalled the earlier times, when the forests of Gadhkharak, offered a dense canopy of 'Banj' (Oak), 'Uttis' (Alder), 'Burans' (Rhododendron), all endemic to the region and was a sanctuary to diverse flora and fauna. But much of the green density was lost in the last few decades, when the needs of the people exceeded, far beyond the largesse of the forest. Slowly but surely the land had lost its firmament. In fact the name of the village, 'Gadhkharak' (Gadh in the Pahari dialect literally means river, and Kharak implies cattleshed) denotes the time, when the dense green cover of the region, had sheltered large cattle heads in the close proximity of the river Pasol. The site of the nursery was selected at a thinned-out patch in the Gadhkharak forests, lying between Ufrainkhal at the top and the main village settlement below. It was a challenge for the people, to nurture about 25,000 young saplings. Rows of shallow trenches lined the terraced landscape, infusing life into the various indigenous species of plants, lovingly tended by the people.

Simultaneously, stone protection walls were also built between the forest border and the terraced slopes. Along the wall, the people planted fuel, fodder and fruit trees. The main objective of the people was to curb, further degradation of the remaining forest cover and complement the regeneration of the stark, barren hillsides. Afforestation was also undertaken on the impoverished lands, that had become too poor to be brought under plough and required special care to recover their lost vitality. The trees that had once stood tall and upright were reduced to stumps, poorly anchored to the ground. The lush, green hillsides wore a gnarled, desolate look. A picture of decay greeted the eyes. The village of bounty had been

reduced to remorse. Could the land bear the test of time, patience and once again reward the people of their efforts, and recover its lost ground, was the lurking doubt, upmost in the village minds. But this once, the people had avowed to try their best.

The conservation of land was not just in raising a nursery and planting trees. The fortitude of the people was set to trial, with the decision to enforce a 10 year restriction on one part of the village forests, to lend a hand to the game of nature, to facilitate the process of natural regeneration. Untouched by external forces, to allow nature to take its own course. Both the land and its people underwent a test in time. While it was the potential, the latent power of the land, it was the patience and self-discipline of the people on trial, charged by the selfless labour and service of the Mahila Mangal Dals.

Gurli Devi of Gadhkharak has been the epitome of the womens' strength. The women's collective had members from each household. And a security network was adopted to ensure, that unwanted trespassers were kept at bay and the imposed restrictions, not violated. The women took on the task of being clever watch keepers; vigilant and determined. To the beat of the 'Khankar' (a wooden pole or 'Jhandha' served with ghungroos or Khankar or bells at its top), the women patrollers announced their presence in the vicinity. A rotational system of responsibility, ensured the patrolling duty of two women from each household, twice during the day. One team patrolled the protected area in the morning till the time of the afternoon meals. Placing the 'Khankar' on their return, outside the door of the next team, to take over the change in duty from the afternoon to evening. The division of duty and the sharing of responsibility, is planned out in the monthly meetings of the Mahila Mangal Dals. The courtyards of the houses or the panchayat bhavan, become the scene of a women's mela every month.

The sustained efforts of the people bore fruit. The village nursery raised more than the required healthy plants. And the successful experiment in Gadhkharak raised the hopes of the dejected neighbouring villages. The surplus, young plants were bought by the forest department and the endeavours of Doodhatoli Lok Vikas Sansthan, won the confidence of its monetary funders. A scheme to replicate the nursery plantations with stone protection walls and environmental awareness camps was granted for 10 more villages, for a period of three years and by late '85, the hill people began their tryst with destiny.

The outreach of the Doodhatoli Lok Vikas Sansthan, in more than 100 villages within a decade of its inception, has been the outcome of local interaction and participatory action, facilitated by the four annual environmental camps held in different villages. Two camps in the winter season and two camps in the summer. The environment camps are an exercise in awareness generation, understanding, learning and educating, but the crucial element of this comprehension is put to task in the long hours of 'Shram', (labour), selfless voluntary physical service. The month of Jeth (June, pre-monsoon period), heralds the first camp of the year. Dedicated to the repair or renovation of the stone protection walls and watering of the growing plants, in the thirsty season of summer heat. But with the first shower of rain, the land is ready to accommodate, fresh new saplings in its fold. The months of July or August, are peak seasons for afforestation and plantation activities are in full swing. The third camp of the year is again in the pre-winter period. Generally



*Laying the stones of patience*

held in the month of Asuj (October). Sharad is slowly creeping in. This is the time to dig out the earthen pits, required for planting the winter saplings. The last camp of the year is scheduled for the month of February (Mau), in keeping with the time for winter plantation. Thus, the schedule of the environment camps, is governed by the needs of the plants. Two summer camps, one in preparation and the next for direct planting, in keeping with the species to be planted in the monsoons and two winter camps for plants requiring winter plantation. The environmental camps are planned for a period of 3-10 days, depending upon the leisure period of the native agro-pastoral communities. Often one village, becomes the camping ground while the Shramdaan extends well into 2 or 3 neighbouring villages, according to the need and the enthusiasm of the participating villagers. Mostly participation is not just limited to the host village. People travel long distances to contribute and dedicate their services.

Mahila Mangal Dals of the various villages come together and it seems as if floodgates of communication and interaction are opened. The camps are the meeting grounds for planning, structuring and scheduling activities, exchanging notes of hopes and despair. These camps in the hills, have become symbolic of 'Jan Sammelans' or people's 'Mela' (fair). The host villages, open out their hearts, in welcome, to their guests. The beginning of the camp is marked by a joyous procession, complete with 'Dhol' (drums) and 'Shehnai' (similar to a clarinet) announcing the people's festival, in active labour and service. The sweat and toil of the bare hands is rewarded with the springing to life of barren lands. And the constructive and creative efforts of the people has never gone waste. For even wasted land has come to life.

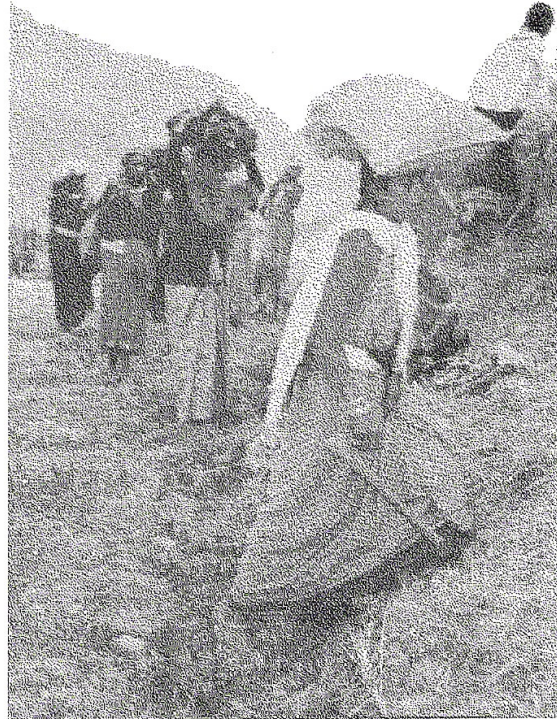
The seeds of life are a treasured asset. There can be no plantation without the crucial seed, that nurtures the sprouting plant in its womb. The Doodhatoli Lok Vikas Sansthan and its people, have been self-reliant in raising plants for afforestation. With the initial grant and the sale of their saplings, the organisation declined external support, only accepting nominal funds to realise the actual costs of the four annual camps. Much of the plantation activities are replicated with the corpus raised from the sale of the surplus saplings, saved beyond the needs of the villages. This sum has been used as a revolving fund, complemented largely by the spontaneous seed collection activities, adopted by the villages to ensure enough seed

stocks, to facilitate the formation of nurseries and plantation activities.

These camps are more of a culmination of events and efforts, that silently go on in the villages, throughout the year. The beat of the Khankar everyday, is not just a protective exercise, the time to check out the growing plants but to also observe the effects of seasons at play. The period of flowering, to the period of fall, the season of bearing fruit and the time to collect the fallen seed. The actual planting of trees is a continuous process in distinct stages. Beginning with the identification and collection of the right seeds. Each indigenous species is bound to its individual timing. The seed of the most auspicious hill tree, the 'Deodar' (Cedar) used for the doors and roofs of temples, is a very light and fine. Along with the 'Banj' (Oak) and the 'Pangar' (Horse-Chestnut), the 'Painyan' (Mountain Cherry), 'Burans' (Rhododendron), Poplus, the 'Uttis' (Alder); all require six months to a year, of gestation period and after the seed germinates, the young saplings are ready to be transplanted. Some require the winter months for plantation, others the monsoon and still some like the Poplus, propagated by their cuttings and grafting, can be planted in both the seasons. Grass varieties of indigenous species like the 'Bhimal' and the 'Chamliu', are again suitable for both the seasons. Yet still, fruit trees like the 'Akhrot' (Walnut) is a hardy species, capable of withstanding many odds and can be propagated by direct sowing. The preparation of seeds and saplings for plantation, has seen the development of many spontaneous nurseries in the villages. Some even, as large as to support more than 25,000 young plants. In such cases, the Doodhatoli Lok Vikas Sansthan, contributes to the efforts of the people and the host family which may have allotted the land for the nursery. A small honorarium renders to support a full-time gardeners' help, in tending to the young plants.

Within a span of 10 years, the people of Gadkhkharak managed to successfully restore, 50 hectares of their forest cover. Enough to meet the fuel and fodder needs of the small village and only lifted the ban on entry, after the stipulated period of 10 years. Still the process of conservation and disciplined, judicious use continued. The home of the people truly extended, from individual homesteads into their forests. Equally lovingly tended and cared for. The forests, over the period of time

*The treasured seeds of life*



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have become the 'Bijak' (inventory) of people's efforts. And the efforts continued despite the fulfillment of the village needs. In the daily routine of collecting fodder and fuelwood from the forest, the people were extremely conscious of what, and how much they took from their forests. Even the old and decaying trees were not left untended. The people sustained their interdependence, by regular sowing and protecting stem and root stock of old trees. Forest conservation and regeneration had become a way of life.

With the visible resotation of the forest lands, the people even took to large scale fruit trees plantation. In the past, the village of Gadhkharak had been witness to the failed experiment in raising apple trees. The government block officers had lured the village into planting apple orchards, assuring them of good returns. But the first plantation of 2000 trees had failed to produce any of the expected results. The ripening fruit became food for the birds, even before they were ready to be plucked. Secondly, the village people were ill-equipped to protect or maintain the fruits. More so, because the people had been promised the quality or variety of the apple, condusive to high altitude climatic conditions but eventually supplied with a mixed lot !

In early '88, the people of Gadhkharak decided to cultivate walnut orchards, the tree, native to their mountains. It seems that the tree is 'Sarva Guna Sampan' (Sarva=all, Guna=quality, Sampan=complete), with all the best qualities suitable to high altitude planting. The hard nut of the fruit saves it from the menance of pecking birds and all the parts of the tree are useful. The roots of the tree maintained the water table, its leaves used in bio manure, and the bark of its branches are used in the most expensive toothpastes. The most crucial part in raising walnut is that, it is a tree that hardly requires any extra attention or fuss. It belongs to the hard stock. Even direct sowing guarantees survival of 60% germination but if raised in a nursery and transplanted after 1 year, it can withstand any odds. The tree begins to bear fruit after 12-15 years and one can be assured of good returns, for at least the next 25 years. Besides, its fruits are hardly prone to rotting and are disease resistant. Further, the walnut has a ready market for its produce and is an assured source of continued income. The beauty of the walnut tree is a sight to behold. Standing high and firm above the ground, giving out long arms and leaves, it can be easily spotted even from a distance.

But the complexity of mountain topography, including variations in elevation, slope and orientation to the sun; create large variations in temperature, radiation, wind, moisture availability and soils over very short distances. This physical diversity leads to comparable variation in vegetation and animal life. An indication of the extreme climatic variation in mountains is that every 100 m. of elevation gained, is roughly comprable to 100 kms. change in latitude. With high, daily and seasonal variability in solar radiation, temperature and precipitation, weather becomes a key factor in the distribution and variety of soils. This phenomenon is more that evident in comparison of Gadhkharak to Dulmoth.

Gadhkharak and Dulmoth are two villages, perched on two distinct hillsides, on almost diametrically opposite hill slopes, facing each other. The valley of the river Pasol separates the two hillsides at the base. The village of Gadhkharak, lies huddled in the shadow of sunlight on the leeward side, balanced on the northern slopes of the mountain face while Dulmoth on the southern slopes, enjoys the



warmth of being on the sunward side. The orientation to the sun, the slope and the elevation, makes Dulmoth distinctly different from Gadhkharak. Largely augmented by the difference in elevation between the two villages. Dulmoth lies almost 500 ft. below Gadhkharak, at about 5000 ft. This difference in the height, coupled by the variable orientation to the sun, produces an easily visible change in the temperature and climate of both the villages. Even in the peak winter period, Dulmoth is hardly ever covered in snow. Much of it just melts away, owing to its sunward location, while Gadhkharak lies cloaked in sheets of ice and snow. Owing to this difference in the temperatures of the two villages, Gadhkharak is known as being located in the 'Sila' region (Sila=moist, cold) and Dulmoth in the 'Taila' area (Taila=warm, receiving direct sunlight).



*Pine : The errant God of social forestry*

Dulmoth is a large village of more than 50 households, with the village forest extending much beyond a single hillside. The march of 3300 hectares of the village forests lands, leaps and strides across several hilltops ending in almost close proximity of Ufrainkhal. (Though some part of the forest is shared by another village, Dandkhal). Thus, the large expanse of Dulmoth forest, had reared the populous agro-pastoral families of Dulmoth in its cradle. The numerous cattle herds of Dulmoth had no dearth of forage in the wide, verdant spaces of the forest canopy.

The village pattern of Dulmoth is similar to Gadhkharak, only perhaps greatly magnified. The agricultural fields rise from the base of the foothill, in the valley next to the river, to the middle of the hillsides occupied by the village dwellings. The upper reaches of the hillsides were furnished with the thick canopy of the forests, encircling consecutive summits. Though, a large part of the forest was sacrificed in the last two decades, to make the high terrain accessible by road. The forests of Dulmoth in the past, had been home to many 'Kharaks' (cattle sheds) in the summer months. When the people of Dulmoth, migrated into the recesses of the forests with their large cattle herds, returning back to the village, only with the

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advent of winter. Dulmoth was truly symbolic of the abundance of Doodhatoli and its equation to a basin of milk.

But Dulmoth had also suffered acutely in the grip of deforestation. Rampant logging, removed the forests far away from the easy reach of the people and the number of kharaks dropped. Migration to the kharaks had been replaced by outmigration of the Dulmoth youth, to the plains.

The first environment camp of Doodhatoli Lok Vikas Sansthan was organised in Dulmoth in '91 and by '92, the villagers were eager to begin afforestation activities and started with 50 hectares of depleted forest land. The Mahila Mangal Dal of the village, again fostered the lead. While the village people actively dug out earthen trenches, DLVS, supplied the initial saplings of Banj (Oak), Deodar (Cedar) Burans (Rhododendron) and Uttis (Alder) and large quantity of indigenous species of grass (Chamliu) were planted.

By '90-'91, the Doodhatoli Lok Vikas Sansthan became concerned with another critical problem in the hills. Many hill districts were in the grip of acute water scarcity. The land of Ativrishiti, of heavy rainfall was fast becoming a case in water thirsty regions. In the early '90's, the neighbouring district of Almora, once considered a water content region, had about 85% of the area, facing severe water shortage. While the hill-states thirsted for water, the nation blamed the Himalayan mountain farmers, for causing massive downstream floods in the Ganges and the Brahmaputra rivers, as a result of upstream deforestation.

But massive flooding of the large rivers, has its root cause in the natural erosion following heavy rains along denuded hillsides.

Erosion from commercially extractive industries, especially logging and poorly constructed road cuts. While the hill-states had become highly vulnerable to landslides, owing to the loss of forests, the downstream catchments faced massive sedimentation of the river beds and river courses and thus sudden flash floods.

The flow of water through mountain watersheds is a timeless phenomenon, that belies the real fragility of these environments and their vulnerability to human interference. Since marked topographical relief produces unstable surfaces, mountain soils are usually young, shallow and poorly anchored. Another key factor is the effect of gravity on steep inclines, which can produce massive movements of weathered rock and soil, stripping some kinds of terrain bare while accumulating rich deposits in others. Especially in the absence of adequate vegetation cover on top ground, to anchor the soil together. Thus, in the case of denuded hillsides, the gravity powered erosion, largely accelerates silt and sediment movement. The increase in water speed

The dynamics of soil and water within most watersheds, is significantly magnified in the mountain watersheds, owing to its unique, fragile and vulnerable ecologies and ecosystems. Watershed management in the wide context has come to primarily denote, water harnessing, harvesting and conservation. Much so in the water scarce regions but in the mountains, land management, soil and forest conservation is primary to water harvesting.

produces immense erosive power of rapid run-off in the mountains, creating not only sudden and irreversible losses to soils but also causes heavy sedimentation in rivers, with the excess soil in the belly of the water course, resulting in undue flooding in the downstream.

The dynamics of soil and water within most watersheds, is significantly magnified in the mountain watersheds, owing to its unique, fragile and vulnerable ecologies and ecosystems. Watershed management in the wide context has come to primarily denote, water harnessing, harvesting and conservation. Much so in the water scarce regions but in the mountains, land management, soil and forest conservation is primary to water harvesting. For mountains have been considered the planet's water towers, by receiving much of its precipitation. The Himalayas function as interceptors of the global air-circulation, forcing the warm air upwards where it condenses into clouds and causes rain and snow. And the vegetative blanket of the land, served as the natural harvester and keeper of the raining downpour. The dense forest cover anchored the soil firmly to the ground while the indigenous species of Banj and Uttis, known for their water fixing capacities, functioned as storehouses of water. The Bugyals or mountain pasture lands with their abundant grass, insure against excessive surface drainage, facilitating much of the moisture absorption into the land, from which it drained slowly by the various rivulets or 'Chhoyas' (monsoons streams), and 'Gadheras' (mountain nallahs or drains), meeting up with the main rivers like the Ramganga, Nayar; collecting and gathering the water wealth of the mountains, to contribute to the big rivers in the plains. In fact, this slow and assured movement of water from the hills to the plains, greatly contributed to the perennial character of the rivers. The big rivers thus remained full of water, all the year round.

But with the massive deforestation drives in the mountains, the dynamics of soil and water, its equilibrium and balancing properties had been severely disturbed. And it wasn't as if this crucial relationship between the soil and water, was unknown to the development lobbies but with the environmental policies of small villages being made in mega cities, much of our remote corners are caught between conflicting mandates, that become the cause of unexpected consequences and natural calamities.

Another important example of lopsided policies, lies in the much hyped and overrated government sponsored social forestry and wasteland development programmes. The mandate of social forestry contradicted its own agenda by propagating mono-culture plantations. (Social should have hopefully provided a wider spectrum of species.) While in the plains, it came to be recognised as large scale Eucalyptus plantations, it got converted into Chir (Pine) species in the mountains, deemed apt for the high altitudes. The promoters of faith, could learn much, from the profuse biotic variation or biodiversity of the mountains. Perhaps for them, the biological extravagance of the mountains, got holed in the general belief that plant diversity declines with increasing elevation. Though this may be true outside the tropics, numerous exceptions still exist. But the Himalayan spread certainly lies within the tropical zone. And the planted Chir, wrecked havoc on the hillsides instead of the respite it was promoted to provide! The myopic vision of tropical highlanders, can hardly see beyond Conifers and Chir the deserving child of the Pine species. And Chir has, certainly taken its toll on the ecological sensitivity

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and fecundity and the proclivity, of the Himalayas to harbour volumanously diverse species within its fold. Chir is a species, that sucks the land it is planted on, almost dry, greatly affecting the water fixing potential of the land. It is a competitive tree that hardly allows any other ground vegetative growth or grasses or even other species of trees, to rise within its realm. Increasing the alkilinity levels in the soil that affects the fertility of the land.

Chir was promoted as a successful bio-manure by mixing its leaves (called Pirul) with 'gobar' (cow dung), but its use on farmlands, only increased the pest 'Kurgala', a worm, that not only damages the crops but the soil also. The only benefit of Chir lies in its great demand by the paper mills and the timber industry. A large tract of Dulmoth had been converted into Chir plantation. And the people of Dulmoth felt cheated. Cheated by the false promises of the Chir touting slogan lobby and cheated of the fertility of their lands.

In early '90's, DLVS, had started to make small interventions to sustain and conserve the ample water reserve of the mountains. Beginning with Gadhkharak in early '90-'91, the village forest had prospered into a dense canopy of indigenous species, abundant in the clusters of Banj, Uttis and Deodar, that are all custodians and rechargers of groundwater and anchored the soil firm against erosion. Still the mountain Gadhera (nallah, drain), which in earlier times had sustained its flow throughout the year, had begun to run dry during the summer months. It required extra input of water to run its full course all the year round. The people of Gadhkharak made small 'Jal Talais' (Jal=water, Talai=pond, reservoir), in the upper reaches of the village forests, to stall the immense surface run-off, that otherwise rapidly meandered downhill. The vast, top ground tree cover, facilitated the natural process of infiltration and augmented the water holding capacity of the land. Uttis is known to give out roots that, almost spread like a network, reaching far into the soil, serving almost like capillaries supplying nourishment and water into the deep recesses of the earth. These small water bodies helped to augment the moisture level in the soil and became a source of replenishing the drying water course. Within two years, the dry Gadhera became alive with the splash of rolling water for the entire year.

In '94-'95, water conservation was initiated in earnest.

The watershed management system adopted by DLVS, is typically unique to their home in mountain watersheds. Quite unlike the other, ongoing experiments in the hills and vastly distinct from those in the plains. In the past three years, the people of Gadhkharak and Dulmoth have developed, an ingenious network of Jal Talais, along the face of the hillsides, to tap the rainwater. What appear like small basins or trenches of shimmering water from afar, are in effect rectangular earthen pits, measuring 2 m. in length with 1 m. width and a depth of 1 m. The excavated soil serves to line the periphery in raised earthen mounds, planted with indigenous species of grasses like Chamliu, Munj. Built almost equidistant, in symmetrical rows along the landscape. The distance between two Jal Talais is marked by another smaller earthen pit, of about 2 ft. by 2 ft. and a depth of 1m., to anchor indigenous species of mountain trees.

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In Dulmoth, these Jal Talais dot about 30 hectares of a large tract of a hillside, considered absolutely 'Banjar' (unproductive wasteland) and barren, along a steep slope with a 800 m. decline, stretching to the river Pasol, gushing in the valley

below. Encompassing the hillface are about 1500 Jal Talais, interspersed with about a 1000 young saplings of the Walnut tree. The manure for the plant pits was mostly supplied by the individual households, who own the plot of land on which the Jal Talais and the trees are planted, while the plants were provided by the people's organisation. The monetary cost of digging out the small Jal Talais was borne by the organisation at a humble sum of Rs. 50, extended to the people in lieu of the services rendered, in excavating the Jal Talais and Rs.5 for the earthen plant pits. An almost unheard of fraction, of the expenditure, borne by the government departments, undertaking similar watershed management practices!



*Jal Talais : small but efficient*

This tract of hillside has been harnessed, to curb the massive surface drainage and the rampant soil erosion, which had washed away much of the topsoil, in the absence of adequate vegetative spread, converting the fertile landscape into totally unproductive. The large erosion of silt and sediment making its way, directly into Pasol at the foothill, was also checked. Besides, the regeneration of fodder grasses on the sides of the Jal Talais, provided the daily sustenance of the cattle herds, within easy reach.

In Gadhkharak, most of the Jal Talais have been built in the village forest land within dense vegetative outgrowth. Almost serving like an upper watershed or catchment, for perennial water supply to the Gadhera of Gadhkharak. A total of 500 Jal Talais, lie mostly camouflaged under the heavy shelter of grasses and shrubs.

As one descends into the village settlement, another level of thick foliage greets the eye. This once served as the narrow band of the uncultivated land, lined by the stone protection wall on the outer side. But today it has changed into a flourishing fodder reserve of the village. The foliage of indigenous fodder and fuelwood trees planted in the early '80's, have grown tall and thick, within a decade. Nature has taken its natural course and the land has prospered. Today the cattle, that are to

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The natural variability has enabled the mountain communities to become custodians of vital crop species, flowering in genetic diversity, in originality and species endemic to the hill regions. Some would term it, traditional staple crops but it harbours the indigenous agricultural practices, aimed at sustaining long term productivity of the land for local consumption, and not short term maximization of yields for sale. And it may have its roots in the treasured value attached to the soils.

Mountain ecosystems may take centuries to recover from heavy losses of soil and the people take utmost care to ensure that their soils remain protected, productive and fertile.

water of the Gadhera through 'Guls' or irrigation channels. These narrow canals run like horizontal water paths, cut across the main watercourse of the Gadhera. Intercepting and diverting the waters of the Gadhera at four different levels, in accordance with the various tiers of the terraced fields. The proximity and use of irrigation broadly divides the farmlands into irrigated or 'Panchar' fields (pan=water) and 'Ukhar' or unirrigated fields.

The fertility of the lands is further improved by manuring. But the people of the hills, depend only on bio-manure. The silt brought down by the Guls and the manure of the old, cowshed litter or leaf mould. During the summer months, after the rabi harvest, the cattle are also, in some places penned in the fields, simplifying the operation of manuring.

A system of rotation of crops, is employed in, retarding the exhaustion of the soil. These methods are a result of many years of experience since, any land in which two harvests are gathered in a year, some sort of rotation is a matter of

be stall fed, do not have the women traversing miles to fetch the needful. All the needs are fulfilled, right at their threshold.

Interspersed within this tier of the fodder bank, are the orchards of the people. The people of Gadhkharak, inspired by the coming back to life of their poor soils, have planted many mountain species of fruit trees, along with the indigenous species of Banj, Tilonj, Burans. Apricots, Plums, Peaches, Pears, Citrus varieties of Oranges (Narangi, Malta), Lemon, Banannas and yes even Apples ! (This time round the people are prepared to take care of them.) But it is the Walnut, that stands the tallest amongst them all. Its rise so magestic, its branches stretched out so straight and aligned and its crown of unfurling green leaves; it is a tree not to be easily swayed by the mountain breezes. An edifice of beauty, perhaps matched only by the mystical vision of the Deodar.

Resting below this ramp, is the cluster of the slanting roofs of the village dwellings on one side, while the Gadhera lines the western flank of the farm lands reaching down to the Pasol. From its source in the forests at the head of Gadhkharak, it has been recharged by the water seeping into the water course, by the numerous Jal Talais that retard the excess surface drainage and nourish the land with moisture throughout the year. So much so, that the farmlands are irrigated by

necessity. But in Garhwal, a simple rotation is not practicable, since in most lands, the early autumn crops have to be sown before the spring crops are ripe. Thus, multicropping of two or three varieties of grain, sown together, ensures the full utility of the land. It is generally believed that farming in the mountains because of its lofty elevation, that induces cold, thin air has short growing seasons and only low biomass productivity. But the vast differences in the elevation, of a single village expanse, between high and low levels, of rise and slope and orientation to the sun, creates large variations in temperature, moisture availability and soils over short distances and thus diversity in productivity and yield. The land lying at the bottom of the incline, in the valley, is the warmest part of the village. And as one ascends the hill slopes, the temperatures dip. This natural variability has enabled the mountain communities to become custodians of vital crop species, flowering in genetic diversity, in originality and species endemic to the hill regions. Some would term it, traditional staple crops but it harbours the indigenous agricultural practices, aimed at sustaining long term productivity of the land for local consumption, and not short term maximization of yields for sale. And it may have its roots in the treasured value attached to the soils. Mountain ecosystems may take centuries to recover from heavy losses of soil and the people take utmost care to ensure that their soils remain protected, productive and fertile.

The kharif crops, reaped in September, are chiefly of rice and coarse grains of 'jhingora' and 'mandua'. Others are 'ugal' (or buckwheat, *fangopyrum esculentum*), 'kaunri', 'chuwa', 'til' (sesame), 'chinha' (*panicum miliacum*), maize and pulses of 'urd' or 'mash' in the hills, 'gahat' (*dolichus biflorus*) and 'bhat' (*glycine saja*, part of the kidney bean variety). The hill 'tur' (*cajanus flevus*) corresponds with the 'arhar' (*c. bicolor*) of the plains, a common kharif lentil. The rabi crops, reaped in April, consist mainly of wheat, 'jau' (barley) and mustard.

On an average each household, owns about 50 'Nalis' (2.5 Nali=1 bigha) of farmholdings. Of these about 10-15 nalis, are Panchar or irrigated fields. In Dulmoth, the people have been able to recover a tract of about 50 nalis, in the lower reaches of the hillside, served with Jal Talais. The presence of the Jal Talais, in the upper reaches of the landscape, has nourished the impoverished land back to health and raised the moisture level, in the singularly barren slope thus making it arable again. Hence the process of upland losses, having immense downhill ramifications has been reversed. Taking advantage of the close proximity of the river Pasol, the people constructed a Gul, to help irrigate the restored fields.

The efforts and interventions required to nurse the forest and arable lands of Dulmoth back to health is a long process. For the expanse of Dulmoth is almost in a series of tiers and slopes, running into a succession of hillsides. Observed from an angle, the lands of Dulmoth seem to gradually rise in stages, along the incline. The layout of the village, is similar to Gadhkharak but its wide expanse, almost has a singular hillside devoted to a single purpose. The lower rungs of the ladder, ascending from the base in the Pasol valley, are the agricultural fields, stretched out horizontally along the contours of the lower slopes. In the middle reaches is the large flat land, serving as an even plane for human habitation. Above this tier, lies the zone of the grazing grounds or 'Charagah', along one side of the hill while the other side has the Jal Talais and at the top of the ladder runs the vast crown of the 3300 hectares of the Dulmoth forest lands.

Gadhkharak on the other hand, is more of a unified spread, along a single hillface. Though the main village may lie perched at a higher level than Dulmoth, it is more of a single unit divided into different zones. While the geographical expansion of Dulmoth, makes it an epitome of various units of land, too far-flung from each other, to be tied together in a singular unit.

This singular unification of Gadhkharak, has helped the people to cultivate and regenerate their lands in many diverse ways. Today, the Gadhkharak lands, yield rich harvests in many fruits and vegetables. Potatoes, Cucumbers, Custard Apples, Brinjals, Tomatoes, Carrots, Onions, Ginger, Garlic, Turmeric, Yam, Spinach, French Beans and varieties of green lettuce and in some parts even Soyabean, all nurtured by the sweet waters of the Gadhera, recharged by the Jal Talais in the uplands.

The people have even started to plant fruit trees within their courtyards and farmlands. The large scale plantation of the walnut in both the villages, is an effort to create economic banks for the people. The long fruit bearing potential of the tough tree, is instrumental in, ensuring rich economic returns to the people.

But the efforts of Doodhatoli Lok Vikas Sansthan is not clouded by monetary gains. The objective of water conservation, goes much beyond soil and land management, to magnify the sustained endeavours of the mountain communities to nourish and revitalise the thinning headwaters of the Himalayan rivers and recharge and augment their volume in the upper watersheds. These Jal Talais serve in restoring, the lost and crucial link between upper and lower watersheds. Their small sizes may be misleading but the cascade of water from hundreds of Jal Talais along the hillsides, evokes a powerful image of small water bowls, emptying out their pockets in humble tribute, to the large vessel of milk, their benefactor, their Doodhatoli.

And Doodhatoli in itself, is an ode to celestial harmony. A foothold into heaven. In mythology, the mountains are often referred to as the cosmic pillars, by which people or gods can ascend to or descend from the sky. In human civilisations, the mythology may have translated into the reality of the movements of air, water, soil, animals and people from the mountains to the plains and that too largely to landscapes even further below. It has been much of a downhill story, descending from the high reaches to the lowlands.

Still the people of Gadhkharak, Dulmoth, the marginalised communities, strive to restore the eternal balance and harmony in their virtual cosmic domain. Carving out a niche, with their fortitude and ingenuity in the image of perfect union between the mountains and the skies, the mountains and the people.

If the world's highest mountains, have been able to inspire extraordinary fortitude and ingenuity in the climbers drawn to their summits, then the secluded communities and the fragile ecosystems from which these pinnacles rise, merit no lesser commitment. But the strife of life, is not merely in conquering the summits but in staying at the top. Surviving not in exploitation or monopolisation, but in symbiotic interdependence. In the virtue of discipline, reverence and sanctity. The sanctity of life, perhaps more vulnerable and fragile than its human counterparts.

The mystical visions that evoke the spiritual conscience in our being, also have a spirit, a soul of their own. To keep the spirit of the mountains alive, the foothold into heaven, is the real challenge.