

SUMMARY AND CONCLUSIONS

This case study underscores the extent to which gender differentials, implicit in enhanced monetisation of the local economy, need to be examined. It has done so by discussing some of the interrelated dimensions of women's low status and "invisibility", which serve as powerful constraints in their life options. These include :

- o **the cultural/ideological dimension** which, coupled with the physical dimension, limits their access to information, reinforces their dependence on men, and strengthens the element of isolation in their lives;
- o **the economic dimension** which undervalues the extent of their contribution to household (including agricultural) survival strategies; and
- o **the political dimension** through which they are denied a voice in traditional community structures, and informal parallel organisations.

Women are locked into **providing labour**, without necessarily gaining a commensurate voice in **defining their work agendas**. Identification of the interlocking factors that are simultaneously increasing their work burdens, whilst depriving them of active participation they once enjoyed in various spheres of agricultural and domestic decision-making, is crucial to a more informed and sensitive understanding of what women stand to gain or lose, under the present system.

The Fruit Belt Zone

It can with justification be argued that Saklana's experience with cash crops is not, and cannot be representative of hill agriculture which, in the main, remains subsistence-oriented. Given the new policy orientation, however, it is likely that this independent valley initiative will be replicated in other resource-rich regions of the U.P. hills. As such, it offers a unique opportunity to examine the outcome of various policy interventions, both direct and indirect, on ecological and socio-economic relationships and structures.

If Saklana is a transitional area, where both traditional and newer patterns of agricultural production coexist, it is instructive to look at the "fruit belt zone" (along the northern limits on the Mussoorie-Chamba ridge) where the process of commoditisation is virtually complete. The designation of this area, as a horticultural zone, along the lines of the successful Himachal Pradesh model, is one of the major policy interventions in the region, in the last two decades. It serves as a classic example of how the privatisation of common lands (through the creation of horticultural *pattas* or holdings) has radically altered land utilisation and resource management patterns.²⁹

The major ecological and socio-economic transformations initiated include:

- o Conversion of forests and other common lands for horticultural and agricultural purposes. As the value of land increases, illegal expansion of holdings is making further inroads into forest and grazing lands.³⁰

- o Loss of predominantly oak and rhododendron forests has had serious ramifications for animal husbandry. Livestock holdings are diminishing, and reflect the increasingly arduous conditions of fodder collection. Many households no longer maintain animals, preferring to hire bullocks during the ploughing seasons, and to purchase milk for domestic consumption. Lack of animals has inevitably affected availability of farmyard manure which, in turn, is jeopardising fertility of the land.
- o There has been a perceptible decline in rain and snowfall since the late 1970s, and local water sources are drying up. Water has to be pumped up to a height of 8,000 feet from the valley. Land lying above this level requires additional pumping, which all but the most prosperous land holders cannot afford to install. A common sight all along the ridge are clusters of utensils -- jerry cans, tins and brass vessels -- surrounding dry or barely dripping taps.
- o Most poor grantees are unable to wait for the minimum of 7-10 years, before their orchards become economically viable. Responding to the economic incentives provided by close access to roads and markets, most *pattas* have consequently been converted to the **exclusive and continuous** cultivation of potatoes and peas. Fields have been cut out of steep slopes, contributing to high levels of soil erosion. Traditional foodgrains are only grown in the valley lands.
- o Despite proximity to roads, the marketing infrastructure is highly inadequate. No significant attempt has been made to set up local growers' co-operatives. Most cultivators are already caught up in the credit cycle and have no option, but to sell their produce at disadvantageous prices to contractors. Many people prefer to sell their harvests independently along the roadside. The few who organise their own marketing and transportation manage to do quite well.
- o Financial "prosperity" is visible in the form of conspicuous consumption (large cement houses with flat roofs, televisions, and so on). Very little appears to be channeled in either productive or social investment, although the potential and need in both spheres is possible and critical. Health care and education are low priorities, especially for older girls.³¹
- o Although *pattas* are unalienable, there is a growing market for land speculation and many plots have already been sold to the urban elite. There are already many indications of what the future holds in store for this area: advertising billboards, inappropriate "urban" style construction, easy access to home-brewed and "English" liquor. The latter is an attempt by the U.P. Government to encourage tourism. Increasing pressure is being placed on an already fragile resource base, to provide water and fuelwood to meet the needs of urban tourists.
- o Fragmentation of village communities into individual households' that have set up permanent residence along the road.³²
- o Transformations in this commercialised zone have marginalised women at a number of related levels. The ridge represents a world dominated by men. Women, who are culturally constrained from participating in that domain, are for the most part, not much in evidence. Pressures on their lives take two forms. First, privatisation and the loss of common lands have affected both the intensity and conditions of women's daily work. Denied access to biomass which earlier was available along the ridge, they walk long distances along the road, (often accompanied by younger children of both sexes) to collect fuelwood and fodder. Orchard grasses, once freely available have become commodities, often selling for between

Rs. 500 - Rs. 1,000 per 5 acres. Theft is inevitably becoming common and a source of conflict. Second, the penetration of warped urban values and mores (e.g. prostitution which reduces women to mere commodities) is contributing to a deterioration in their status.

What Can Be Done?

This case study does not argue against the introduction of cash crops into hill agriculture. Indeed, given contemporary realities and constraints, there seem to be few other opportunities for communities to gain access to locally-generated incomes. Nevertheless, the cultivation of off-season vegetables for sale in urban markets, as the proposed "solution" to underdevelopment in the hills, begs certain questions. Does it have the capacity to redress regional imbalances that have historically defined relations of dependency between the hills and the plains. Or is it exacerbating an already "lop-sided" relationship? As presently conceived, is this policy being effectively implemented, and if not, have these constraints been identified, and, what could be done to overcome them? If it is recognized that the longer-term costs might be too high, alternative approaches and strategies could be pursued?

The applicability of this commercial-oriented policy is restricted to ecologically well-endowed hill regions, which are already relatively well-connected to marketing and infrastructural networks. It does little for degraded and resource-poor regions. This raises the concern for these areas which may not only remain neglected, but become more marginalised in the years to come.

Reorientation of Cash Crop Agriculture

Two aspects regarding the present cash crop orientation need to be addressed. First, if the present approach is to remain intact, then it needs to be carried out more efficiently. At the moment, credit availability constraints, poor inputs, inadequate storage facilities, inadequate marketing and transportation infrastructure and information dissemination render it haphazard and ineffective. There is a pressing urgency for greater coordination between agricultural research institutes, extension services and the local inhabitants. Virtually no effort has been made to identify, monitor and evaluate the impact of various interventions on different groups within the community, nor to determine what their needs are. Farmers require location-specific information regarding the use of inputs. This can be only achieved if the research institutes and extension services are actively involved in the region, and have some understanding of the types of constraints and needs facing cultivators in specific areas. The issue is not one of "educating" villagers but, rather, of initiating a dialogue.³³

The new trends focus on the inherent unviability of an export-oriented agricultural system at the cost of meeting local basic food needs. The present (all-India) trend points to the development of commercial agriculture (vegetables and so-called "superior" food grains, e.g. wheat, corn, and rice) at the expense of coarse cereals. These not only constitute staple food for the majority of poor rural households, but they play a vital role in animal husbandry strategies. The justification cited for this transition is that:

- o the "superior" cereals are cheaper than the production of "inferior" ones, and
- o changes in cropping patterns and production for the market, will provide the income for supplementing household consumption.

Millet which is hardy and highly adapted to conditions of low rainfall and manuring, must not be neglected in the rush to find "productive" alternatives which are water-dependent and require high chemical fertilizer input. What does this shift mean for poorer households, who have to purchase in the market, what they once grew on their own lands. Or what does this mean to people who do not have access to guaranteed adequate purchasing power to keep one step ahead of the "credit trap"?

Any effort to try to undo this inherent bias against coarse grains would involve considerable amount of "public relations" work. Despite the high nutritional and caloric value of millet, villagers favour wheat and rice which, along with refined sugar, are important indices of economic well-being. They would have to be motivated to devote more time to acreage to crops they now consider "unproductive". Agricultural researchers, too, must place emphasis on early and late-sowing varieties of millet, to allow cultivators more flexibility, in the event of early, late or no monsoon rains.³⁴ This would contribute to greater stability of farm incomes, create less dependence on markets, and fulfill important animal husbandry requirements, by providing adequate fodder straws.

More serious attention needs to be devoted to traditional agricultural practices and methods, recognising farming as an inherently integrated, rather than a fragmented process. There are, however, some inefficient management practices which, with minor modifications, could help cultivators realise significantly higher yields. A case in point is improper composting methods and the use of sub-quality organic wastes (farmyard manure) which lowers crop productivity. Typically, FYM is stored in open heaps, resulting in high loss of nutrients into the air and leaching into the soil. This could be easily redressed by storing in pits. Under-application of FYM also results in lower crop yields, often dictated by constraints in animal husbandry and the tremendously high labour intensity of the work, (rather than poor management practices). Intensive landuse is also leading to the use of FYM which is not properly matured.³⁵

Finally, what does this agricultural orientation do about the high levels of unemployment and underemployment in hill communities? At present, virtually nothing, with the exception of the fruit belt zone where mainly migrant Nepali labour is absorbed to some extent. There is tremendous potential for channeling labour into eco-regeneration schemes involving irrigation, soil and water conservation, terracing and afforestation. Establishment of rural-based industries using local resources would also provide opportunities for employment.

Hill Development and Women

Despite the rhetoric of sensitivity to gender issues, women's needs remain peripheral to hill development policy. There is little likelihood that gender relations will change in the future. Village communities are becoming more dependent on markets, (both as consumers and producers) and the off-farm incomes they provide. Men are increasingly withdrawing from agriculture, in order to participate in external labour markets. Education and employment are distancing youth from the land and setting in motion, a process of "incipient class differentiation." Consequently, in the longer-term, market-oriented agriculture can only be maintained by the continued exploitation of women's labour.

If the "fruits of prosperity" aren't percolating down to women, if their lives and work are increasingly being dictated by agendas into which they have little or no input, then what is to be done? Is it even viable to pose this as a problem of hill development, given that hill communities in general have virtually no say in decisions concerning their livelihoods?

If one accepts that certain processes are marginalising women economically, socially and politically, even as they are assuming an increasingly vital role in the agrarian economy, then the challenge is:

- o to identify what these processes are, and
- o to determine how they can be addressed.

Although it is vital to create the conditions under which women can assume a more active role in agricultural management and decision making, this is much easier said than achieved. However, the option of allowing present trends to continue unaddressed is untenable, if for the simple reason, that it will ultimately prove detrimental to social and ecological sustainability.

The biggest problem the women of Saklana face is lack of time. Given present conditions, the sheer labour intensity of their work, women would not be able to take advantage of training and extension programmes. Some potential avenues which could help to draw women into the mainstream of economic life are, nonetheless, listed below.

Improved Credit Facilities/Loan Guarantee Programmes. Organised banking has to become more sensitive to women's needs, and the constraints under which they operate. Since only men are considered heads of households, women cannot and do not apply for formal credit/loans on their own. Thus, women are totally dependent on men to initiate the agricultural cycle. The result is that widows and other female de facto heads of households are often compelled to be unproductive, because they lack adequate financial resources to hire labour to plough their fields.

Rural Training and Extension Programmes. At present no such programmes exist in Saklana even for men. Apart from instructions on agricultural production techniques, there is considerable potential for training and mobilising the community in adult education and primary health care. There is a considerable body of partially educated and certainly very bright young people who could be trained as *gram sevaks* and *gram sevikas* to work amongst local communities. Involving villagers in such work would also help to engender a greater sense of accountability between personnel and communities. Women's knowledge of traditional healing and childbirth techniques could also be effectively tapped to help fill the inadequacies of the existing allopathic medical system. There are a number of older women, in particular, who could be trained as *dais* and *balwadi* (childcare) instructors.

Sectoral Programmes. These include animal husbandry, agriculture, and resource conservation, including forestry. Evidence drawn from other case studies conclusively points to the failure of projects which ignore local people in general, and women, in particular. Given the lack, historically, of participatory involvement in this region, special emphasis would have to be directed to understanding how to involve women in such sectoral activities.

Non-formal Education/Income-generating Work. They could help women develop the confidence and skills required to interact with external institutions, such as government bureaucracies, credit institutions, and the market. This would allow women to perceive themselves as being less dependent on men. Elsewhere programmes of this nature have typically been most successful when integrated with practical training (such as income-generating activities). Although access to their own sources of income would boost women's self-confidence (if not lay the groundwork for possibly more equitable relations within the household) there is, however, no tradition of female entrepreneurship in this area. This is further aggravated by time constraints and lack of income-generating options (e.g. oil pressing, selling milk, and poultry farming) available to women in this

area. It is, however, an important issue since women, with no access to off-farm incomes, often find themselves in positions of extreme impoverishment.

Information Samitis. The absence of any informal or formal organisation for women and men is perhaps the singlemost important drawback for development work in this area. The impetus for collective action generally emerges out of both objective conditions and subjective perceptions of costs and benefits of such involvement. Despite the growing pressures on women's lives in this area, the imperatives clearly aren't strong enough yet. But mobilising women can only begin, once they perceive the need to demand changes in their lives and, more importantly, feel confident to participate in such efforts. Youth groups could also play an important role in involving young people in community and environmental issues.

Avenues For Future Research

Despite the tremendous florescence of research on women's roles in agriculture over the past decade, the vast majority of literature maps out patterns on a macro-level, and within the context of "green revolution" agriculture. Less attention has been devoted to detailing micro-trends which could provide critical information regarding women's work and responses to changes in hitherto neglected agro-ecological zones (e.g. rain-fed and coarse grain mountain farming systems). There is, consequently, considerable scope for exploring women's work and the implications of various types of interventions, on their lives. Application of a self-consciously gender-sensitive perspective would facilitate redefinition of hill development policy and strategies, by detailing the constraints women face, and focusing on their specific needs.

Areas for further research include:

- o Detailed disruptions of women's and men's roles in various agricultural operations and time allocation studies. This would provide better understanding of how different forms of technological changes effect participation by sex, within the agrarian economy.
- o Utilisation of the farming systems approach, to develop a framework for understanding interrelated components of household survival strategies. This would need to include traditional patterns of natural resource utilisation and conservation, agricultural production, women's roles in firewood, water, and fodder collection, forestry, as well as documentation of traditional systems of knowledge. There is also a pressing need to clarify, through more empirical research, some of the well-meaning but often misplaced conceptions of women's actual/potential roles in resource management. Greater attention must be directed to examining how specific agro-ecological, political, and economic imperatives help to shape people's responses and serve as constraints or catalysts for eco-regeneration.
- o Identification and analysis of constraints (legal, socio-cultural, and economic) which prevent women's access to control and/or ownership of the means of agricultural production. This would help in articulating the means by which to channel resources and services more effectively towards women.

NOTES

1. For examples of how economic criteria are used to the exclusion of others, see various articles in Chadha, ed. (1988), Pandey and Tripathi (1986), and Tripathi (1987).
2. A tendency symptomatic of much of the Himalayan literature is to telescope very different agro-ecological, geo-morphological, and socio-economic milieus into generalised statements about "the" problem(s) facing the Himalayas. For discussions of the problems inherent in the implied homogeneity underlying the "Himalayan dilemma", see Ives and Messerli (1989) and various articles in Ives and Pitt, eds. (1988).
3. Much of the research draws on a fragmented and sectoral approach that leaves out other equally critical parameters such as erosion of the natural resource base, intensification of work burdens, differentiation within the household, class polarisations, and other multi-faceted implications of increasing participation in the market economy.
4. The valley is geographically demarcated into upper and lower Saklana and consists of over forty villages in thirteen *gram sabhas*. The main focus of fieldwork was in four villages of Upper Saklana, with in-depth work conducted in one.

According to the 1981 Census this region has a total population of 4,208 persons, with 2,052 males and 2,156 females. The total scheduled caste population is given as 476, with 251 males and 225 females.

Information from the Block Development Officer, Jaunpur, Tehri Garhwal, cites income distribution for a total of 932 households, including 133 scheduled caste and 54 female-head households as follows:

| | | |
|-----------------|---|----------------|
| Below Rs. 2,265 | : | 6 households |
| Rs. 2,265-3,500 | : | 230 households |
| Rs. 3,501-4,800 | : | 120 households |
| Rs. 4,801-6,400 | : | 91 households |
| Above Rs. 6,400 | : | 485 households |

Land utilisation (cf. Block Development Officer) is as follows. Information is not available for forest, pasture, and horticultural areas. Details of acreage devoted to specific crops were also incomplete and therefore not included.

| | | |
|--|---|-----------|
| Total geographical area | : | 1,378 ha. |
| Barren and waste land (unfit for cultivation) | : | 386 ha. |
| Barren land (fit for cultivation) | : | 197 ha. |
| Unused land | : | 92 ha. |
| Cultivated area | : | 703 ha. |
| Kharif Crops | : | 703 ha. |
| Rabi Crops | : | 388 ha. |

5. Apart from Pujar, some data was also collected from Jard. The two villages form a single *gram sabha* and, because of the latter's substantial scheduled caste population, a variety of labour-sharing arrangements are entered into. However, for various reasons it was difficult to develop a rapport with the Jard inhabitants, and so various important aspects of the caste/class relationship remain muted.
6. Some excellent discussions and reviews of issues can be found in Agrawal (1988); Bardhan (1986); Duvury (1989); and Papanek (1989).
7. Very little research has been done on hill women in the Indian Himalaya. Sharma's (1980) comparative study of women and work in a Punjabi and Himachal village is the only one of its kind for the hill areas of north-western India. See also Bhati and Singh (1987). For an exhaustive bibliography of women in Indian agriculture, see Prasad (1988). The Nepal context provides some useful conceptual perspectives and empirical insights to fill in these lacunae. See in particular Bennett and Acharya, eds. (1981). For an overview of these findings see Acharya and Bennett (1983) and Pradhan and Bennett (1981); Pradhan and Rankin (1988); and Shrestha (1988).
8. See selected bibliography for ethnographic citations.
9. See selected bibliography for citations on the Chipko Movement. Most of this writing is descriptive, discussing specific mobilisational events. Some pieces seek a more analytical approach by raising the tension between gender and class, micro-macro linkages, etc. There has, however, been regrettably little discussion about the risks women bear in the course of forging a role for themselves in the "public" domain. Another neglected dimension is the role of external institutions which, whilst purporting to be rooted in the lives of "the people" and speaking for them, in actuality are detached from them. This process of "appropriation" is of tremendous importance in understanding the ebbs and flows (or complete absence) of collective action in various hill regions, and offers a partial explanation for women's (and men's) sense of alienation from many grassroots initiatives.
10. See Guha (1983 and 1989) for excellent discussions on the historical context of forest policy and peasant movements in the hills.
11. The absence of regulatory mechanisms and structures is in contrast to the situation in more ecologically fragile areas such as the depleted areas of the rain shadow of the Bhagirathi valley. This area has traditionally had a high degree of environmental consciousness, the existence of both formal and informal organisations and a tradition of collective action. Nonetheless, even here these traditional institutions for the collective management of scarce resources, are being eroded partly as a consequence of the state stepping in to claim responsibility over what was earlier a communal activity. Knowledge of hitherto well-defined boundaries for the collection of fodder and firewood is being lost, and the villagers talk of increasing inter-village tensions due to theft. See Guha (1989) for a discussion of earlier traditions in various parts of the Garhwal and Kumaon districts, including Tehri Garhwal.
12. Guha (1989, 27-28) suggests that "The absence of sharp class cleavages within village society clearly owes its origins to the ecological characteristics of mountain society." He relates this as "major ecological constraints to the generation of surplus and consequently to the emergence of social classes in hill societies. In Uttarkhand ...

agrarian society has had a more or less uniform class structure, composed almost wholly of small peasant proprietors, and with a marginal incidence of big landlords and agricultural labourers."

Land records are at best approximations since they do not reflect sales and purchases over time. Most people also do not know how much land they own. The traditional unit of land is the *nali* (20 *nalis* = 1 acre), which designates the area that can be sown using grain in a standard size tube of bamboo. See Moench, 1985.

13. There are four *Harijan* sub-castes in this region: *Kohlis* (weavers), *Lohars* (metal workers), *Darzis* (tailors) and *Charmars* (leather workers). Within the fairly rigid wider system of stratification, they observe their own hierarchies. Thus, the first two sub-castes occupy the highest positions and intermarry, whilst the *Charmars*, at the bottom of the ladder, live in a separate enclave within the village.

14. The initial surveys conducted in four villages revealed the following distribution of landholdings. (It is, however, important to bear in mind that official land records do not reflect land sales and purchases).

| | | |
|-------------------|---|---------------|
| 5 acres and above | : | 3 households |
| 4-5 acres | : | 4 households |
| 3-4 acres | : | 6 households |
| 2-3 acres | : | 6 households |
| 1-2 acres | : | 11 households |
| Below 1 acre | : | 26 households |

15. Access to education, although available to everyone, reveals a strong gender and caste bias. Village surveys indicate that 63% males and 39% females have received some form of schooling, with education level for males and females substantially higher amongst Brahmins, than either Rajputs or scheduled castes. Very few girls from scheduled caste households receive any exposure to schooling, and even boys are rarely kept in school much beyond the primary level.

16. In 1988, field labour cost was Rs 10/- a day plus one meal, tea and *bidis*. Women were paid less in both cash and grain than men, even for the same tasks. Public Works Department (PWD) contracts, such as road clearing and maintenance, commanded a much higher rate at Rs 22/- per day, but these were typically of short duration and, hence, could be relied upon as regular sources of income.

17. Surveys, however, indicate that the size of animal holdings has not changed considerably over the past twenty or so years: 29 households say their holdings have remained stable over a period of 10-20 years; 20 say they are smaller because, they no longer keep goats and sheep; and 6 have considerably larger holdings now.

18. This situation is quite different in areas closer to the roadhead with proximity to hill urban centers. See Moench (1985) for some discussion of the burgeoning market for milk in recent years in the Aglar watershed.

19. Goat manure is considered excellent fertilizer and villagers compare its productivity to that of chemical fertilizers.

20. These points are raised by Moench (1985) and substantiated by this fieldwork.
21. The cultivation of two or more crops, with legumes growing over the *mandua* stalks, provides some protection against diseases and serves as a potential security in the event that one crop is lost to disease. Villagers' responses to the reason why this practice of mixed cropping is observed, however, was invariably "*ye hamara rivaaj hai*" (it is our custom).
22. The country-wide potato glut of 1988 affected the wholesale price of local produce. In addition to this, heavy rains too early in the season, spoilt a considerable part of the harvest. In October of the same year, a truck drivers' strike seriously affected transportation of essential commodities and raised prices. Had the strike not ended in time, it would also have affected the pea season which begins at this time.
23. This trend towards permanent settlement dispersal was first noted by Berreman (1963, 61-62). It is also becoming common in areas participating in the milk trade near Musssoorie and Chamba.
24. Dispersal of communities is particularly apparent in the "fruit belt zone" along the northern ridge.
25. Pradhan and Bennett (1981,7)
26. Moench (1985, 63) concludes from similar findings that "the mixture of fodder types fed is not dependent just on availability, but also on the specific characteristic of the fodder".
27. Based on the findings in *The Status of Women in Nepal*, Acharya and Bennett, eds, (1981).
28. Differential access to consumer goods is particularly noticeable amongst the younger generation. Young men who work elsewhere and school-going youth, frequently purchase items such as toothpaste, toothbrushes, and soap which other household members, particularly women and girls, do not have access to. Whilst watches, radios and fancy clothes bought by relatives or friends living in towns, are also becoming more commonplace.
29. Over 500 plots ranging between 3-5 acres have been allotted to both locals (including scheduled castes) and absentee grantees (many of whom are retired army personnel).
30. Old revenue records indicate that less than one percent of the land currently being used for horticultural and/or agricultural purposes used to be fields (personal communication, Mr. S. Singha, April 1989).
31. During my trip a young man committed suicide by taking an overdose of pesticide. That he was unable to be taken to a hospital in time to have his stomach pumped out, was cited as an example of how backward the area still is.
32. In the late 1970s there were only a handful of "*permanent chaans*" along the roadhead, whereas now most households live on the ridge all year round and maintain only cursory contact with their villages in the valley (Mr. Singha, personal communication, April 1989).

33. The lack of communication between research centers and villagers is illustrated by the fact that neither the High Altitude Crop Research Centre at Ranichauri, approximately 30 kilometers from Saklana, nor the Dhanolti Potato Farm, have made any attempt to become involved with the villages of Saklana.
34. Using traditional farming methods and seeds, *jhangora* yields 5-6 quintals/hectare. With improved management practices this rises to 10-15 quintals/hectare. However, even though agricultural research centers have developed improved varieties of millet, dissemination of information and inputs is poor if not non-existent (Dr. G.K. Dwivedi, personal communication, 17 April 1989).
35. Research conducted by the Hill Campus suggests that the recommended application is 10-15 tonnes/hectare (1 hectare = 50 *nalis*) whereas most households apply between one and three tonnes/hectare (personal communication, Dr. Dwivedi).