

MULTIPURPOSE TREES FOR SMALL FARM USE WORKSHOP. ✓

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PLANTING TREES ON PRIVATE FARMLAND IN  
NEPAL: THE EQUITY ASPECT. ✓

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## Abstract

This paper discusses the equity aspects of private tree planting programs in Nepal. The discussion revolves around a review of the literature and includes analysis of data based on a preliminary survey and field observations in two field sites. In recent years there has been an increasing interest in planting trees on private land in Nepal, but a problem with this policy is that it mostly benefits land wealthy people. As there is little absolute landlessness in Nepal it is possible that moving emphasis away from establishing private forests (on fairly large private plots) to planting on small pockets of non-agricultural marginal land (edges of fields, creek beds etc) may enable planting to benefit small farmers. However analysis of field data suggests that the benefits to the poor are likely to be limited. It is possible, but remains to be proved, that private planting may lead to a reduction of the pressures on common forest resources and that this may increase access to these resources by the poorest farmers and landless people. It is argued that, whatever the value of private planting, it must be seen as a supplement, not an alternative, to planting common land.

## Introduction

In recent years there has been an increasing interest in planting trees on private land in Nepal. His Majesty's Government of Nepal (HMG/N) has developed a policy based on the provision of technical advice and materials (seeds and seedlings) to people who wish to establish forests on private lands registered for the purpose. Several of the bilateral aid projects involved in forestry provide seedlings to farmers on request. In some cases seedlings are provided for nothing, as in the cases of the Community Forestry Development Project, the Integrated Hill Developed Project and the Nepal Australia Forestry Project. In other cases a small fee is charged, as in the case of the Pakhribas Agricultural Centre (Malla 1987).

The aim of this paper is to discuss some of the implications of these programs to the equitable distribution of resources. There are many "perhapses", "maybes" and "mights", because the

paper is intended to provoke discussion rather than to provide firm answers.

The emphasis on the planting of trees on private land results partly from a recognition of the importance of multipurpose trees in small farming agro-forestry systems (Robinson 1986) and the potential for the planting of trees on private land in bridging the gap between demand for and production of forest products (Robinson 1986). It has also been observed (Malla 1987) that a great deal of private land is not directly used for agriculture. This includes non-arable marginal lands, land along paths, stream beds, on very steep slopes, on the edges of terraced fields, and around houses. The amount of land available in these categories is difficult to calculate but one case-study suggests conservatively that just under 20% of private land consists of various types of non-arable land (Malla 1987). There is obviously considerable potential for planting multipurpose trees on this land.

In addition to these perceptions of private planting as an opportunity to utilise an otherwise underutilised or wasted land resource, there is also a common assumption that trees on private land are much more likely to be protected than those on common land. This assumption is a legacy of the "tragedy of the commons" argument (Hardin 1968) which concludes that people will overuse common resources in the absence of strong sanctions. In the light of this argument planting trees on private land is seen as being a sustainable solution to the problems of deforestation because people will protect them. It is not our intention to discuss the tragedy of the commons argument in detail here, but it is worth noting that there is a considerable body of opinion

which rejects a simple dichotomy between well-managed private resources and poorly managed common resources. The tragedy of the commons view fails to distinguish between quite distinct forms of common resource management systems: open access systems (those where use is unrestricted) and common property regimes (resources with regulated access by joint owners with defined rights) (Bromley 1986). There is no a priori reason why common property regimes cannot involve sound sustainable management.

A recent report for USAID in Nepal (Kernan et al. 1986) argues in favour of transferring public forest lands into private ownership essentially in terms of a tragedy of the commons argument:

"The principal advantage of private ownership is that the individual looks after his own interests more carefully than those of the public, and the public is usually better off with the results ... Most degradation has taken place as a result of natural processes and on communal lands for which no one individual has responsibility". (p 31).

The report goes on to mention the possibility that transfers of land into private ownership "... can bring into conflict the social goal of equity and the economic goal of the more efficient use of resources". (p 32). This paper is essentially concerned with the questions of equity which are raised by programs which emphasise planting of trees on private land rather than with programs promoting the transfer of ownership of land. However, the equity question remains relevant. There are two basic questions: (a) will private planting programs be of benefit to more than a small minority of farmers? and (b) will they reduce or increase existing inequalities?

Discussions about equity tend to founder upon a lack of agreement as to what constitutes an equitable outcome. It is not necessary to insist that equity requires precisely equal sharing of benefits, although some people may use this as a definition. The word equity has connotations of "fairness" and "justice", not necessarily of equality. There are a number of scenarios or patterns of distribution which would be described as equitable by one person or another. For example, one scenario is a situation in which all farmers benefit in proportion to the size of their landholdings, with all benefitting in absolute terms, but poor farmers gaining less in relative terms. In another scenario rich farmers gain proportionately more than poor farmers as well as absolutely more. In yet another scenario poor farmers and rich farmers benefit equally in absolute terms, with rich farmers gaining less in proportional terms. Equity is a subjective issue, a matter of policy, not a question which can be decided by objective definition. Nevertheless, it is possible to compare subjective models of what might be acceptable against objective, or likely objective, outcomes. One task of socio-economic investigation is to examine patterns of distribution of benefits or to project likely patterns of distribution, to see which of the scenarios mentioned above actually apply or are likely to apply. Once this has been done the issue of the equitability and acceptability of the outcomes is a separate question. It is not our major intention to define what is acceptable or "equitable". Rather we wish to raise questions about a number of distribution ratios, or scenarios, which arise or might arise from private planting programs.

It is quite possible for a program to be acceptable as a

solution to technical or environmental problems, but to be unacceptable on equity grounds. It is a philosophical issue.

## Review of the Literature

### (a) Distribution of Private Trees and Participation in Private Planting Programs.

In terms of increased overall availability of forest resources, and possibly in terms of increased efficiency of use of resources, programs which encourage private planting would seem to have advantages. Ideally all farmers would profit proportionately. While small landowners would benefit relatively less than large landholders, all would be better off in absolute terms. There are, however, two problems with this scenario.

Firstly, the extent of the discrepancy in relative benefit is very large because the distribution of landholdings in Nepal is heavily skewed. According to Wallace (1987) 13.6 % of the population holds 62.8 % of the agricultural land. (Table 1 sets out land distribution figures based on the 1981/82 census). The extent of the absolute differences in landholdings is so large that the distribution of benefits will be overwhelmingly in favour of a small number of landholders, even if benefits are provided in proportion to landholding size.

Secondly, there is evidence which demonstrates that, in practice, distribution of benefits proportional to landholding size does not occur. Gautam (1986) examined seedling distribution in a single panchayat in Dolakha district. According to his findings people holding more than one hectare of land were 2 % of the population but received 75 % of all

seedlings distributed. Forty-six percent of the population owned landholdings of one quarter of a hectare or less, and this category received no seedlings. Gautam does not attempt to account for the massively disproportionate distribution of benefits. Only 40 households within the panchayat received seedlings so it is quite possible that the recipients are all influential locals who are aware of nursery activities. If so, increased extension attempting to reach the smaller farmers, might help to correct the distribution pattern.

Analysis of involvement in private planting programs from four panchayats within the Pakhribas Agriculture Centre's project area showed a much higher rate of participating households than in Gautam's study with 59 % of all households participating (Malla 1987). Again, there was a difference in the average landholding sizes of participants and non-participants (3.45 ha versus 2.0 ha). Unfortunately information on the average numbers of trees taken by participants within various landholding categories is not available meaning that it is uncertain whether bigger participant landholders took proportionately or disproportionately higher numbers of trees per unit area than smaller participant landholders.

Other studies with information on private planting are not particularly helpful in terms of showing the distribution of seedlings or trees on private land, by landholding size and thus show little of interest from the point of view of equity. Shrestha and Evans (1984) report an average landholding size of 0.39 ha for households in Chautara (Sindhupalchok District) and an average of 17.01 trees per household. However there is no information on the relationship between tree numbers and

landholding size. In any case the number of trees per household seems extraordinarily low.

Hawkins and Malla (1983), in a study of patterns of ownership and use of farm fodder trees in three panchayats in the middle hills, look at the average numbers of fodder trees per household and at the average number of fodder trees per livestock unit, but do not relate tree numbers to landholding size at all.

The literature is, then, not very helpful either in showing present distribution of private trees according to the size of landholding, or in showing whether larger or smaller landholders are more likely to respond to private planting programs. Nevertheless it is clear that in the context of the highly skewed distribution of landholdings in Nepal, attention must be paid to the differing effects of private planting on land-rich and land-poor farmers. It also appears (from Gautam's study) that the benefits of private planting programs may be diverted towards larger landholders. The evidence is not conclusive, but raises serious queries.

#### (b) Potential Benefits to Small Farmers

The above discussion outlines some of the arguments and supporting evidence against emphasising private planting. However there are arguments both ways. Quite apart from the proportionate benefit model, there is one strong argument in favour of private planting for the benefit of smaller landholders. Chambers and Leach (1987) have argued that trees on private land are an important resource for the rural poor, not merely because they provide increased income but because, more importantly, they act



as a form of security in the case of unexpected events. For example, they may provide resources to deal with seasonal shortages, or resources to deal with such one-off needs as wood for funeral fires, or for the replacement of houses after floods or fires.

It may also be possible to avoid the tendency of planting programs to favour larger landholders disproportionately. It has been pointed out (Malla 1987) that a great deal of private land is not used directly for agriculture. As there is little absolute landlessness in Nepal it is possible that moving emphasis away from establishing private forests on large plots to planting on small pockets of non-agricultural marginal land may enable planting to benefit the majority of small farmers.

## Field Study

### (a) Aims and Methodology

In order to obtain further information on the relationship between land distribution, trees on private land and in order to obtain some information on planting on marginal non-agricultural lands, we have carried out a preliminary study of trees on private land in two villages in the project area of the Nepal-Australia Forestry Project. As the field study was very much a preliminary study we do not aim to establish firm conclusions, but rather to identify issues for later investigation and to provoke further informed discussion. The exercise was also a trial for the questionnaire survey which we used.

The two villages selected were Pandegaon, located about a half hour's drive to the east of Kathmandu in Kavre Palanchok

District and Buchakot, located about a half day's walk from Dhulikhel, the District headquarters of Kavre Palanchok district.

The objectives of the study were:

- To determine the category of local people most likely to benefit from the private planting program.
- To seek indications as to whether the program is likely to further widen the gap between rich and poor.

Methodologically, the approach taken centred around direct observation and informal discussion and questioning. In particular, discussions concentrated on the perceptions and motivations of individual farmers. Some quantitative information was collected, using an informal check-list of questions. In this paper we concentrate discussion on analysis of the quantitative data. However, we must stress that we have very serious reservations about overuse of the questionnaire approach and about the reliability of quantitative data based on survey questionnaires. Doubt about the validity of statistics obtained by survey questionnaires in the developing world have been raised frequently in recent years (Campbell et al. 1979, Hill 1984, 1986, Gilmour et al. 1987, Fisher 1987). Among the factors which lead to unreliable data are suspicion about the motives of investigators and inappropriateness of questions to local patterns of classification (in this case, the classification of land). We are confident that suspicion about motives was minimised because the field investigator (Y.B.M.) had previously spent considerable time in each village and had established good rapport with villagers.

The structured interview focused on individual households. One informant (usually the household head) was interviewed from

ach household. The sample was essentially a random survey with informants being selected by the simple expedient of strolling around the village area and interviewing every individual met. It should be noted that, in the case of Pandegoon, all villagers were previously known to the field investigator.

The sample sizes were small, although they represent a significant proportion of the households of each village (Table 2). The small sample sizes were intentional, given the trial nature of the survey.

The interviews were based on a check list of questions. Many of the questions were open-ended. An assistant was used at various stages, but was not present at all interviews. Where he was present he took notes or operated a cassette recorder while the field investigator asked questions.

The main purpose of the structured interview was to obtain quantitative data on landholding sizes (including a breakdown of various types of land) and on numbers of trees on each type of land. Other questions were concerned with use of and access to trees and forest products.

The land types considered were:

- khet (irrigated fields suitable for rice cultivation)
- bari (rainfed terraces on which maize and millet are grown)
- marginal land and abandoned terraces
- stream banks, gullies and landslides.

(The last two types can be glossed as marginal land.)

Reported figures on land holding size are probably reasonably accurate except for the case of the various types of

ginal land. In these cases figures are little more than "quantified guesses" and are unlikely to be reliable beyond a general order of magnitude. Figures on landholdings have been converted from the locally used measure (ropani) to hectares (20 ropani equals one hectare). It is important to note that, as a consequence of this, figures on average tree densities are derived from quite small absolute numbers of trees. For example 20 trees on a half ropani of marginal land translates to a density of 800 trees per hectare.

For the purpose of comparing the economic status of households, total reported landholdings have been divided into various categories (each based on a range of landholding sizes), following those used by Wallace (1987). It is important to note that total landholdings can be quite misleading as indicators of land wealth. Agricultural land is divided into two categories : khet is much more valuable than bari.

#### (b) The Two Villages

Just as households were not selected at random, Pandegaon and Buchakot were not selected randomly. Given the problems of obtaining accurate information on sensitive matters like landholding size, villages in which the project was well known and in which the field investigator had established a degree of rapport were selected.

Perhaps because of locational factors there are differences in the socio-economic conditions in the two villages. In Pandegaon, which is relatively near Kathmandu, many people are engaged in off-farm activities. Even the land-poor people in

some cases claim to have considerable cash resources. One lady, from an untouchable caste, claimed to have enough money to purchase land but had not done so because no land was available for sale. Buchakot, on the other hand, is far more typical of the subsistence-oriented villages of the middle hills. While agropastoralism is the major source of income in both villages, it is heavily supplemented in Pandegaon.

The patterns of land distribution are different in each village. Table 3 gives the patterns of land distribution in terms of landholding size, for each village. The most significant difference is that land distribution in Pandegaon is relatively homogeneous. No household in our sample owned more than 1.5 ha. On the other hand land ownership is more skewed in Buchakot. Of the households surveyed 52.9 % owned more than 1.5 ha and these households owned 82.6 % of all land held by households in the Buchakot sample. The land distribution in Buchakot is uneven, but there are more farmers in the larger landholding size-categories than in the pattern described by Wallace for all of Nepal and set out in Table 1.

#### (c) Distribution of Trees on Private Land

Analysis of the distribution of trees on private land in the two villages suggests a number of patterns. There is also an absence of some of the patterns we expected to find. Both the patterns and absences of patterns are instructive.

##### Pattern 1

While the sample sizes for each of the land-holding categories are small, we had expected to see some trend of

increasing densities and numbers of trees according to size of landholding. However there was no clear evidence of such a trend in densities for the landholding size-categories below 1.5 ha. Table 4 gives tree densities for each landholding size-category.

In Pandegaon there are no clear trends relating to tree density between landholding size-categories. The same absence of pattern applies to the land-holdings below 1.5 ha in Buchakot. On the other hand there was a contrast between tree densities on landholdings above 1.5 ha and holdings below 1.5 ha. Farmers with 1.5 or more hectares are in a minority: there are none in Pandegaon and only 9 of 17 of the Buchakot sample own more than 1.5 ha.

There is a very clear increase in the average tree numbers for landholders as landholding size-categories increase. See Table 5. There is a massive increase above the 1.5 ha landholding threshold.

#### Pattern 2

If we ignore the nine farmers in Buchakot with 1.5 or more hectares of land there are differences in the tree density (i.e. trees per hectare) between the Pandegaon and Buchakot samples. The average tree density for farmers in all landholding size-categories (below 1.5 ha) in Pandegaon exceeded the density of trees for the corresponding landholding categories in Buchakot.

There are two points to be explained in these patterns. Firstly, why does a landholding size in excess of 1.5 ha appear to be a take-off point above which much higher tree densities become possible? (In Buchakot this occurs even though smaller

farmers have lower tree densities than owners of similar landholdings in Pandegaon).

As a tentative explanation, we would suggest that the "take-off point" is related to the fact that farmers with landholdings above 1.5 ha are able to meet subsistence requirements for grain and are in a position to diversify, spreading risks and gaining opportunities for alternative income. The validity of this explanation should be explored by further study.

The second question is : why the differences in tree density between smaller landholders in Pandegaon and in Buchakot? Different qualities of land may be part of the explanation. The land at Buchakot may be of lower quality than that at Pandegaon. But this does not fully explain the differences since the land-rich farmers at Buchakot own much larger numbers of trees than poorer farmers in either village. A probable explanation is that Pandegaon is less dependent on farm sources for subsistence and income. Consequently farmers are more able to spare small amounts of land for trees. One farmer in the 0.5-0.99 ha category at Pandegaon had considerable numbers of trees, including trees on various types of marginal land, and on the edges of khet. He stated that he recognised that the shade from the trees was reducing crop production by an estimated 20 %, but he felt that the economic advantages of trees outweighed the losses. A number of Chorespondias axillaris (locally known as lopse) grown on his land illustrated his point. The fruit is extremely valuable as a cash crop.

Pattern 3

We had anticipated that a pattern would emerge which would show a relationship between tree density on marginal land types and landholding-size categories. (Table 6 describes the relationships between tree densities on all land types and landholding sizes.) While the 1.5 ha or more groups have generally higher densities on marginal lands, the 0-0.49 ha category has a high density in the land type which includes stream beds, gullies and land slides. In fact, however, all of the land and all of the trees in that category are owned by a single farmer and the density of 1400 trees per hectare is derived from 35 trees on one fortieth of a hectare.

There is, then, a suggestion that marginal lands are underutilised by smaller farmers in both Pandegaon and Buchakot. However the total area of marginal land owned by farmers in the Pandegaon sample was only 0.61 ha (6.2 % of all land). Table 7 gives a breakdown of land types available in each village. In Buchakot 4.86 ha (14.9 % of total private land in the sample) was in the marginal land categories, but only 0.78 ha of this marginal land is owned by farmers owning less than 1.5 ha. Thus, the potential for small farmers to gain from increased tree planting on marginal land is very slight. Even if programs heavily emphasise planting on marginal land there is little opportunity for small farmers to benefit. In order to emphasise this point we wish to point out that we are calling all farmers with less than 1.5 ha small farmers. This is fairly generous.

Analysis of the distribution of bari land among small farmers does point to an area where there is some potential to reach the land-poor. Table 8 shows the distribution of bari land



according to landholding size categories. A significant amount of bari land (9 ha) or 40 % of all bari land) is owned by farmers in the less than 1.5 ha category. However, the importance of bari land to subsistence suggests that poor farmers are not likely to substantially increase tree planting on bari unless they have alternative sources of income. The often observed phenomenon of trees on bari (Gilmour 1987) is probably particularly common on larger landholdings.

### Conclusion

The USAID report referred to earlier (Kernan et al. 1986) made a case for increased privatisation of common land for forest purposes. Robinson acknowledges that there may be some "advantages in the equitable privatisation of some land" but goes on to say:

"The need for any privatisation to be equitable would be essential; small farmers often rely more on land other than their own for fodder and other foliage, compared to wealthier farmers." (1986:115 ).

This is an extremely important point. We believe that increased privatisation, unless accompanied by extensive redistribution of land could only decrease the access of poor farmers to forest products. They would not only be relatively worse off, as larger farmers become absolutely better off, but they could easily become absolutely worse off.

On the other hand it may be that increased planting on private land (as opposed to privatisation of common land) will reduce pressure on common land and that this will be of benefit to smaller landholders, but this remains to be proved. There is

no guarantee that reduced pressure on common land will translate to increased access to resources by the poor, although it may do so. One reason for doubt here is that increased private planting may lead to larger landholders selling products for cash, while continuing to use common resources for their own subsistence purposes.

The whole question of monetizing forest produce has important implications to equity. Hobley (1987) points out that the sale of forest products from forest land would impose quite different demands on the well-off (for whom a few rupees per head-load is a minor matter) compared with the poor (for whom a few rupees may represent a day's work). A major increase in private planting on larger holdings would probably lead to monetization.

An analysis of the findings from Pandegaon and Buchakot leaves little room for optimism about the potential for private planting programs for the benefit of small farmers. Equity in tree ownership is clearly impossible in the context of the dramatically skewed distribution of landholding in Nepal, and there is little room to increase the absolute numbers of trees owned by poorer farmers. Nevertheless, in the context of very small absolute numbers of trees, small increases may be of value.

Our figures are very tentative and based on small samples. While they are consistent with other evidence from the literature it is essential that much larger studies should be carried out to confirm or deny our suspicions. Further, even if our observations appear to be generally true, there may be some locations where the land distribution patterns will allow private planting

programs to reach the land poor.

For such a program to work it would be necessary to concentrate activities on small farmers. One element of this would be increased extension work aimed at making small farmers aware of the program. but it is unlikely that awareness alone is a solution, since farmer-ignorance is almost certainly overrated and unjustly assumed to be an explanation for failure to take up program "benefits".

In order to prevent monopolisation of benefits by relatively wealthy farmers it might be worth thinking about a system of phased charges. Seedlings, up to a certain number (say 200) could be provided free, while numbers in excess of this maximum could be provided at a small fee.

Finally, while programs emphasising private planting on existing private land may have their place, we are overwhelmingly in favour of a policy which treats private planting as part of a broad range of approaches. In order to maintain any equity of access to resources, private planting must be a supplement to, not an alternative to, continued planting, protection and utilization of common lands.

Table 1  
Distribution of agricultural land in Nepal,  
1981/82. Source: Wallace (1987) based on 1981/82 census  
of Nepal.

	% Pop	% Area
Non - Agricultural *	15.1	0.0
#		
No land	0.3	0.0
0 - 0.5 ha	42.5	6.6
0.5 - 1.0 ha	13.7	10.8
1.0 - 2.0 ha	14.7	19.9
Over 2 ha	13.6	62.8
Total	100.0	100.0

\* No land or livestock

# No land, but own livestock

Table 2  
Sample sizes

	No. of households for which interviews held.	Total No. of households in villages
Pandegaon	16	31
Buchakot	17	40 (approx.)

Table 3

Pattern of land distribution for Pandegaon and Buchakot.  
(Note: All types of land combined.)

	LANDHOLDING SIZE (ha)				
	0	0-0.49	0.5-0.99	1.0-1.49	1.5 & over
<u>Pandegaon</u>					
No. house-holds	1	4	9	2	-
%age house-holds	6.2	25	56.2	12.5	-
<u>Buchakot</u>					
No. house-holds	-	3	2	3	9
%age house-holds	-	17.6	11.8	17.6	52.9
<u>Combined</u>					
No. house-holds	1	7	11	5	9
%age house-holds	3	21.2	33.3	15.1	27.3

Table 4

Density of trees according to size of landholding.

Landholding size	Tree density per ha.		
	Pandegaon	Buchakot	Combined
0	-	-	-
0-0.49	236	33	112
0.5-0.99	126	42	112
1.0-1.49	165	35	87
1.5 & over	-	225	225

Table 5.

Average numbers of trees per farmer within each landholding size-category. Numbers of farmers are in brackets. Landless farmer omitted.

Landholding size	Pandegaon	Buchakot	Combined
0-0.49	28 (4)	8 (3)	19 (7)
0.5-0.99	95 (9)	26 (2)	82 (11)
1.0-1.49	199 (2)	44 (3)	106 (5)
1.5 & above	-	671 (9)	671 (9)

Table 6  
Tree density by landholding size and type of land.  
(Zero landholdings excluded.)

Location and land type*	Landholding size			
	0-0.49	0.5-0.99	1.0-1.49	1.5 & over
Pandegaon				
1	nil	23	nil	-
2	167	175	258	-
3	nil	265	nil	-
4	1400	244	460	-
Buchakot				
1	nil	nil	nil	55
2	23	54	56	89
3	13	nil	11	642
4	nil	176	216	1706
Combined				
1	nil	21	nil	55
2	109	157	135	89
3	13	193	11	642
4	1400	220	355	1706

Key\*

1 - khet

2 - bari

3 - marginal land including abandoned terraces

4 - stream banks, gullies and landslides

Table 7  
Types of land available (ha.) for whole sample.

Land Type*	Pandegaon	Buchakot	Combined
1	3.4 (34.8%)	11.32 (34.6%)	14.7 (34.6%)
2	5.75 (58.9%)	16.5 (50.5%)	22.25 (52.4%)
3	0.2 (2%)	3 (9.2%)	3.2 (7.5%)
4	0.41 (4.2%)	1.86 (5.7%)	2.29 (5.4%)
Total	9.76 (99.9%)	32.68 (100%)	42.46 (99.9%)

Key\*

1 - khet

2 - bari

3 - marginal land including abandoned terraces

4 - stream banks, gullies and landslides

Table 8  
Distribution of Bari land by landholding categories. (Zero landholdings omitted.) Both villages combined.

Land categories	Area (ha)	%age of all Bari
0-0.49	0.95	4
0.5-0.99	4.85	22
1.0-1.49	3.2	14
1.5 & over	13.25	59
Total	22.25	99



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