Chapter VII: Marketed Surplus
The economic conditions of developing countries differ considerably from those of the advanced and developed countries. In advanced countries agriculture constitutes only a small part of their economy; it happens to be completely commercialised and developed like any other sector of the economy. But in developing countries, agriculture happens to be the backbone of the economy; and only a small part of it has been commercialised and developed. Consequently, most of the output is produced for the market and only a negligible proportion of their output is retained for self-consumption by the farmers of the developed West. As against this, the agricultural sector is dominated by the subsistence farming by the small and marginal farmers of the developing economies. Naturally, an extremely small proportion of output emerges as the marketable surplus in such economies.

Whereas the farmers in the developed countries keep their savings in terms of money, the farmers in developing countries sell only that amount of output which is needed to satisfy their cash requirements, and they keep the balance of their output for self-consumption and other purposes. Whatever they save is also saved in kind. Like the farmers in advanced countries, better-off farmers in the developing economies may keep their savings in money terms. But in these countries, such farmers
constitute only a microscopic minority, and the majority of the farmers is that of small and marginal farmers whose size of output depends, to a large extent, on the climatic conditions. These farmers usually sell just that portion of their output which suffices to meet their cash requirements and save the balance for personal needs and as a precaution for any adverse weather conditions that may occur next year.

Since Mizoram is economically one of the most backward states in India, there has been almost no agricultural development. Its agriculture, especially jhum cultivation, is solely dependent on weather conditions. Unfavourable monsoons mean low productivity of agriculture, while favourable monsoons lead to higher productivity and production in the agricultural sector of the economy. Commercialisation is far from complete, and the lack of marketing facilities and absence of good communications also hinder commercialisation of agriculture. As such, the aim of the farmers is not to produce for the market but to produce enough foodgrains to meet their own requirements.

Before emergency which surfaced in Mizoram in 1966, the Mizo farmers had been more or less self-sufficient in the production of foodgrains. But as a result of the disturbances, many villages had been grouped together, from the security viewpoint, by the armed forces; and a large
area of cultivable land has been rendered beyond the reach of the farmers. As such, there has been a decrease in the supply of land available to the farmers which has thereby led to the shortening of the jhum cycles. Shortening of the jhum cycles in its turn has led to a decrease in the fertility of the soil, and the productivity of land per acre has been reduced. Besides new lands available for cultivation appear to be less fertile than the ones that the farmers had to leave for the reorganisation of the villages. Both these factors have led to the decline of the productivity of land. As a result, agriculture could not meet even the consumption requirements of foodgrains of the farmers.

It is, therefore, a known fact that the marketable surplus, over and above the self-consumption would be negative. But it does not mean that the marketed surplus would also be negative. This is due to the existence of the distress sales. Besides, larger and medium farmers may still possess some positive marketable surplus though the farmers as a whole, small and marginal farmers may have no positive surpluses to offer to the market. All the same, whatever be the level of output of foodgrains, it is important to look into the marketed surplus of foodgrains to understand the extent to which agriculture has been commercialised; and also to know which of the two modes of cultivation - jhum and settled - have been more commercialised and possess a
greater potential for development and commercialization.

As family happens to be the basic unit of the societies and since in Mizoram the size of holdings is directly related to the family size, we have expected that the family size would have some effect not only on output but on the marketed surplus also. The positive effect of the family size upon output has made us to believe that the marketed surplus would also be positively related to the family size. As the size grows there is an increase in not only consumption requirements of foodgrains but the consumption requirements of other commodities also rise. In order to meet the consumption needs, the farmers with large family would have been required to sell more than the farmers having small families.

But land is the most important output constraining factor of agriculture. Larger the size of the holding larger will be the amount of output and vice-versa. As such the size of holding is expected to have an important bearing on the marketed surplus. We have found that the holding size has a positive effect on the level of output, and while some other factors have an indirect effect on the marketed surplus, the output is supposed to have a direct impact upon the marketed surplus.

In view of the above considerations, we have examined the nature of the marketed surplus with reference
to the family size, holding size and the output level. We have, therefore, attempted to determine the mean and median differences of the marketed surplus of foodgrains with reference to the above factors in order to find out if there are systematic factors at work affecting the marketed surplus in the two modes of cultivation.

7.1 Family Size and Marketed Surplus

We have found that there is no statistical difference between the size of the family in the two sub-samples. On this evidence, we have expected that there would be no significant difference between the size of the marketed surplus in the two modes of cultivation. At the same time, we believe that there should be a positive relation between the family size and the marketed surplus. However, it is plausible to argue for the inverse relation between the family size and marketed surplus. If the holdings owned by the families of the different size groups do not differ in yield, then the larger family means greater requirements of foodgrains for self-consumption and hence, smaller quantities of the marketable surplus.

Mean Difference

Mean value and the median value of the marketed surplus of foodgrains for jhum cultivation are 3.7 quintals and 3 quintals respectively, while the corresponding values
of the marketed surplus of foodgrains for the settled cultivation are 4.7 and 3.7 quintals respectively. In both types of cultivation the mean value is more than the median value in case of marketed surplus also. The mean and median differences of the marketed surplus of the two types of cultivation are more or less similar. Mean level of the marketed surplus in the settled cultivation is 1.27 times the surplus in the jhum while the median level of the marketed surplus in the settled cultivation is 1.23 times that of cultivation. The calculated standard error of the mean difference is .34 whereas the observed difference is 1(one). The ratio of the mean difference to the standard error is 2.94 which is significant statistically. Hence we can say that the difference in the size of the marketed surplus of foodgrains between jhum and settled cultivation is statistically different from zero.

In order to test our hypothesis about the relation between family size and the marketed surplus, we have calculated the coefficient of correlation for jhum and settled cultivation separately. The coefficient of correlation between these two variables in jhum is -.54, while it is -.014 in settled cultivation. In both the cases, there is an inverse relation between the family size and the marketed surplus of foodgrains. Thus, these results do not support our hypothesis of there being a direct relation
between the family size and the level of the marketed surplus in either mode of cultivation. As this,
these results support the alternative hypothesis that
being inversely related to the level of the marketed surplus.
It implies that the greater consumption requirements of larger families leave them with a smaller surplus. The
result: one larger family size tends to make cultivation
turn towards subsistence farming by hindering greater
production for the market. This may be construed as an
impediment to the process of commercialisation and general
development of agriculture. The proportion of measures to
control population especially in the rural Mizoram can also
be justified on economic grounds. But the coefficient of
correlation between these two variables is significant in
jhum only corresponding t value being 5.49, while the correlation coefficient for the settled cultivation is not significant, t value being - .845. But in jhum also, changes in
family size explain only 29.13 per cent of the total variation
in the marketed surplus. But family size explains only
0.02 per cent of the total variation of the marketed surplus
in the settled cultivation. Thus we can say that family size
has nothing to do with the variation in the marketed surplus
of foodgrains in the settled cultivation.

The regression equations of the marketed surplus of
foodgrains (m.f.) on the family size (F) are:
where \( m_f^j \) and \( m_f^s \) = marketed surplus of jhum and settled cultivation respectively.

The estimated parameters have the negative signs and these are significant in case of jhum cultivation only. Corresponding to an unit increase in the family size, the marketed surplus in the jhum cultivation decreases by .63 quintals, while an increase or decrease in the family size among the settled cultivators have almost an imperceptible effect on the marketed surplus of foodgrains.

7.2 Size of Holding and Marketed Surplus

As land is the essential input of agriculture without which there can be no production, the size of holding is expected to have an important effect on output and hence the marketed surplus. Since the size of holding is significantly larger in the settled cultivation than that of jhum, the marketed surplus per holding is likely to be greater in the settled cultivation than in the jhum cultivation.

The mean and median levels of marketed surplus per holding in the jhum cultivation are .3.62 and 2.1 quintals.
respectively, while those for the settled cultivation are 5.08 and 4.2 quintals respectively. The mean values are consistently larger than their respective median values. The marketed surplus per holding in the settled cultivation is 1.4 times that of the jhum; whereas the corresponding median level in the settled cultivation is twice as large as that in jhum. Both these differences are likely to be significantly different from zero.

In fact, the standard error of the mean difference is .3 while the observed difference is 1.46. The ratio of the mean difference to its standard error is 4.87 which is statistically significant. The standard error of the median difference is 0.79 while the observed difference is 2.1. Thus, the ratio of the mean difference to the standard error is 2.7 which is also statistically significant. These results have, therefore, given empirical support to our hypothesis that there would be a significant difference in the average size of the marketed surplus per holding of the settled and jhum cultivation.

The coefficient of correlation between these two variables worked out for jhum cultivation is .5 while the coefficient of correlation for the settled cultivation is .453. In both the cases the coefficient of correlation is significant, corresponding t values being 4.97 and 4.22, for 74 and 69 degrees of freedom. The explained proportion
of variation of the marketed surplus in jhum cultivation is 25 per cent, while it is 20.52 per cent in the settled cultivation. Factors other than the holding size explain as much as 75 per cent of the total variation in the marketed surplus of jhum cultivation, whereas such factors explain 79.48 per cent of the total variation in settled cultivation. Thus, these results have given empirical support to our hypothesis that there would be a positive relation between the holding size and the marketed surplus though we need factors other than the holding size also to explain the changes in the marketed surplus.

The estimated regression equations are as follows:

In jhum, \( \text{mf}_j = -.5 + 1.02 L_j \)
\[ t = (4.97) \quad R^2 = .25 \quad F = (24.7) \]

and in settled cultivation,
\( \text{mf}_s = -3.56 + 1.64 L_s \)
\[ t = (4.22) \quad R^2 = .2052 \quad F = (17.8) \]

In the above equations, the parameters have the expected signs and are significant in both the cases. Corresponding to an unit (acre) increase in the size of holding, the marketed surplus increases by 1.02 quintals in jhum and by 1.64 quintals in the settled cultivation. These results have given empirical support to our hypothesis that the marketed surplus depends upon the holding size to some
7.3 Output and Marketed Surplus

Whereas certain factors have indirect effects on the marketed surplus, output exercises direct influence on the marketed surplus of foodgrains. Since rice is the staple diet and the main food crop of Mizoram, the chief aim and purpose of the farmers is to produce enough rice. Other foodgrains are simply the minor products of agriculture and thus constitute only a microscopic proportion of the agricultural output. So, the present study focuses mainly upon the output and the marketed surplus of rice. As rice is the staple food of the people, the farmers usually like to keep a sufficient amount to meet their own consumption requirements. As such, if the farmers are able to meet the cash requirements for other purposes, usually, they do not like to sell their output of foodgrains unless they produce more than their requirements for a given period, usually one year. Even if they had produced a surplus over and above their own requirements for the year, they usually prefer to save in kind as a precaution against the future shortages that may arise due to unfavourable weather. But the immediate cash requirements compels them to sell a certain portion of their output even if they could not produce enough for self-consumption for the year. It implies that the major driving force behind the farmers' sales of their output in the market is the urgency
and the size of their cash requirements. Another important factor affecting the marketed surplus is the level of output produced within a specific period. Then given the level of output and the cash requirements of the farmers, price determines as to how much they should sell to the market and how much they should stock for their current and future consumption. Thus higher the price, smaller will be the marketed surplus for meeting the given cash requirements, and lower the price the higher will be the marketed surplus. Therefore, the short run supply curve may be negatively sloped. This is compatible to the hypothesis of backward bending short run supply curve proposed by Dharam Narain and Mathur-Ezekiel.

We have, therefore, attempted to test the mean and median differences in order to know if there is a systematic influence of output on the marketed surplus. The mean and median levels of output in the settled cultivation are 26.5 and 24.82 quintals respectively, while the mean and median levels of the marketed surplus are 4.82 and 3.35 respectively. With the jhum, the mean and median values of output are 20.53 and 18 quintals respectively, while the mean and median levels of marketed surplus are 3.65 and 2.1 quintals respectively. Obviously, the difference between the levels of output and the marketed surplus is retain for satisfying the self-consumption requirements though this
ratated portion may not suffice to meet the requirements in toto. In that case, marketed surplus will be larger than the marketable surplus. This aspect has been examined separately.

The standard errors of the mean and median differences of output are .53 and 2.45 while the observed differences are 5.97 and 6.82 respectively. Thus the ratio of the mean difference to its standard error is 11.26, while the ratio of median difference to the standard error is 2.8 both of which are statistically significant.

In view of the significant difference in the size of output, we expect to find a significant difference in the levels of the marketed surplus also. The standard error of the mean difference is .34, while the observed difference is 1.17. Thus, the ratio of the difference to the standard error is 3.44, which is significant statistically. Thus, this result lends empirical support to our hypothesis that the marketed surplus will be higher in that mode of cultivation which produces greater output.

But the exact nature and the extent of interrelation between these two variables can be evaluated by means of regression-correlation analysis. The coefficient of correlation for the settled cultivation is .7 while it is .58 in the jhum. In both the cases, the coefficient
of correlation is significant, t values being 8.14 and 6.14 for 69 and 74 degrees of freedom. The explained proportion of variation in the marketed surplus in the settled cultivation is 49 per cent, while it is 34 per cent in the jhum cultivation. Factors other than output explain 51 per cent of the total variation in the marketed surplus of the settled cultivation; and such factors explain 66 per cent of the total variation of the marketed surplus in the jhum cultivation.

The estimated regression equations are as follows:

$$mf_j = 0.109 + 0.89\cdot Of_j$$
$$t = (6.14)$$
$$R^2 = .34$$
$$F = (38.2)$$

and

$$mf_s = -1.08 + 0.84\cdot Of_s$$
$$t = (8.14)$$
$$R^2 = .49$$
$$F = (66.29)$$

where $Of_j$ and $Of_s$ refer to the output of jhum and settled cultivation respectively.

The regression parameters in both the cases are significant. Corresponding to an unit increase in output, the marketed surplus in the jhum cultivation increases by .89 quintals, while in the settled cultivation it increases by .84 quintals. So these results lend empirical support to our hypothesis that the marketed surplus of foodgrains depend largely upon output.
On this evidence, we can infer that the differences between the marketed surplus of the two modes of cultivation are systematically embedded between their output differences. But we cannot conclude that the settled cultivation is inherently much more commercialised than the jhum or that the jhum is more representative of the subsistence farming than the settled cultivation. But one may invert the problem and pose the question on whether the greater degree of commercialisation leads to higher output. Alternatively, it may be hypothesised that the greater cash requirements lead to larger sales which in turn necessitates higher production.

This hypothesis may be tested by the regression of output ($O_f$) on the marketed surplus ($m_f$). The estimated equations are given below:

\[ O_f^j = -0.897 + 0.38 m_f^j \quad R^2 = 0.34 \]
\[ \text{t} = (6.14) \quad F = (38.2) \]

In jhum, \[ O_f^s = -0.178 + 0.61 m_f^s \quad R^2 = 0.49 \]
\[ \text{t} = (8.14) \quad F = (66.29) \]

The parameters of the equations are significant in both the cases. Corresponding to an unit increase in the marketed surplus, output increases by 0.38 quintals in the jhum cultivation, while that of settled cultivation increases by 0.61 quintals. Thus, the output of the settled
cultivation is much more responsive to the changes in the marketed surplus than the response of output of the jhum cultivation. Therefore, it may not be erroneous on the basis of all these results taken together, we infer that the settled cultivation represents a relatively higher degree of commercialisation than the jhuming.

The data have shown that the total output of food-grains in the two jhuming villages taken together is 1515 quintals, while the total quantity consumed is 1563 quintals. Thus, the output has fallen short of farmers' own consumption requirements by 48 quintals. On the other hand, the total output of the settled cultivation in the two villages taken together is as much as 2022.8 quintals as against the quantity consumed of 1629 quintals. Thus, the marketable surplus in the settled cultivation is 393.8 quintals, while that of jhum is -48 quintals. It appears, therefore, that the settled farmers produce, as a whole, a surplus of 393.8 quintals over and above their own consumption requirements, while the jhumias cannot meet even their own needs for consumption. It has also been revealed that the time/period of sales of foodgrains of the jhumias, in most of the cases, is just after the harvesting of the crop, whereas the settled cultivators sell a portion of their output just after harvesting and another portion of the total sales is marketed during the spring and autumn seasons when foodgrains
are usually scarce and prices are higher. Thus, the
difference between the total sales of the two periods and
the sales after harvesting represent the stocks that these
farmers carry in order to reap the benefits of the differen­
tial prices that prevail in the seasons of plentiful and
scarce supplies. This evidence, therefore, reveals that the
marketed surplus of the jhumias represents particularly the
'distress sales', the positive marketed surplus notwithstan­
ding. It also reveals that settled cultivation is much
more commercialised than the jhum cultivation.