## Annexures

*Annexure - 1*

**Fuzzy Sets**

A fuzzy set can be defined mathematically by assigning to each possible individual in the universe of discourse a value representing its grade or membership in the fuzzy set. This grade corresponds to the degree to which that individual is similar or compatible with the concept represented by the fuzzy set. Thus, individuals may belong in the fuzzy set to a greater or lesser degree as indicated by a larger or smaller membership grade. These membership grades are very often represented by real number values ranging in the closed interval between 0 and 1. 0 and 1 represent full non-membership and full membership respectively. Hence the concept of crisp set in a restricted case of the more general concept of a fuzzy set for which only these two grade membership are allowed.

We know that the characteristic function of a crisp set assigns a value of either 1 or 0 to each individual in the universal set, there by discriminating between members and non members of the crisp set under consideration. This function can be generalized such that the values assigned to the elements of the universal set fall within a specified range and indicate the membership grade of these elements in the set in question. Larger values denote higher degrees of set membership. Such a function is called a membership function, and the set defined by it a fuzzy set.

The most commonly used range of value of membership functions is the unit interval [0, 1]. In this case, each membership function maps elements of a given universal set X, which is always a crisp set, into real numbers in [0,1].

Two distinct notations are most commonly employed in the literature to denote membership functions. In one of them, the membership of a fuzzy set A is denoted by $\mu_A$;

That is $\mu_A: X \rightarrow [0, 1]$

In the other one, the function is denoted by A and has, of course, the same form:

$A: X \rightarrow [0, 1]$

According to the first notation, the symbol (label, identifier, name) of the fuzzy set (A) is distinguished from the symbol of its membership function $\mu_A$. According to the second notation this distinction is not made, but no ambiguity result from this double use of the same symbol. Each fuzzy set is completely and uniquely defined by one particular membership function; consequently, symbols of membership functions may also be used as labels of the associated fuzzy sets. Thus, fuzzy sets allow us to represent vague concepts in natural language. The representation depends not only on the concept, but also on the context in which it is used. For example, applying the concept of high temperature in one context to weather and in another context to a nuclear reactor would necessarily be represented by very different fuzzy sets. That would also be the case, although to a lesser degree, if the concept were applied to weather in different seasons, at least in some climates.

Even for similar contexts, fuzzy sets representing the same concept may vary considerably. In this case, however, they also have to be similar in some key features. As an example, let us consider four fuzzy sets whose membership functions are as shown below in fig 2.1. Each of these fuzzy sets expresses, in a particular form, the general conception of a class of real numbers that are close to 2. Inspite of their differences, the four fuzzy sets are similar in the sense that the following properties are possessed by each $A_i$ ($i \in N_4$),

1) $A_i(2) = 1$ and $A_i(x) < 1$ for all $x \neq 2$;
2) $A_i$ is symmetric with respect to $x = 2$, that is
   $A_i(2+x) = A_i(2-x)$ for all $x \in R$;
3) $A_i(x)$ decreases monotonically from 1 to 0 with the increasing difference $|2-x|$

These properties are necessary in order to properly represent the given conception. Any additional fuzzy sets attempting to represent the same conception would have to possess them as well. The four membership functions in Fig 2.1 are also similar in the sense that numbers outside the interval [1, 3] are virtually excluded from the associated fuzzy sets, since their membership grades are either equal to 0 or negligible. This similarly does not reflect the conception itself, but rather the context in which it is used.

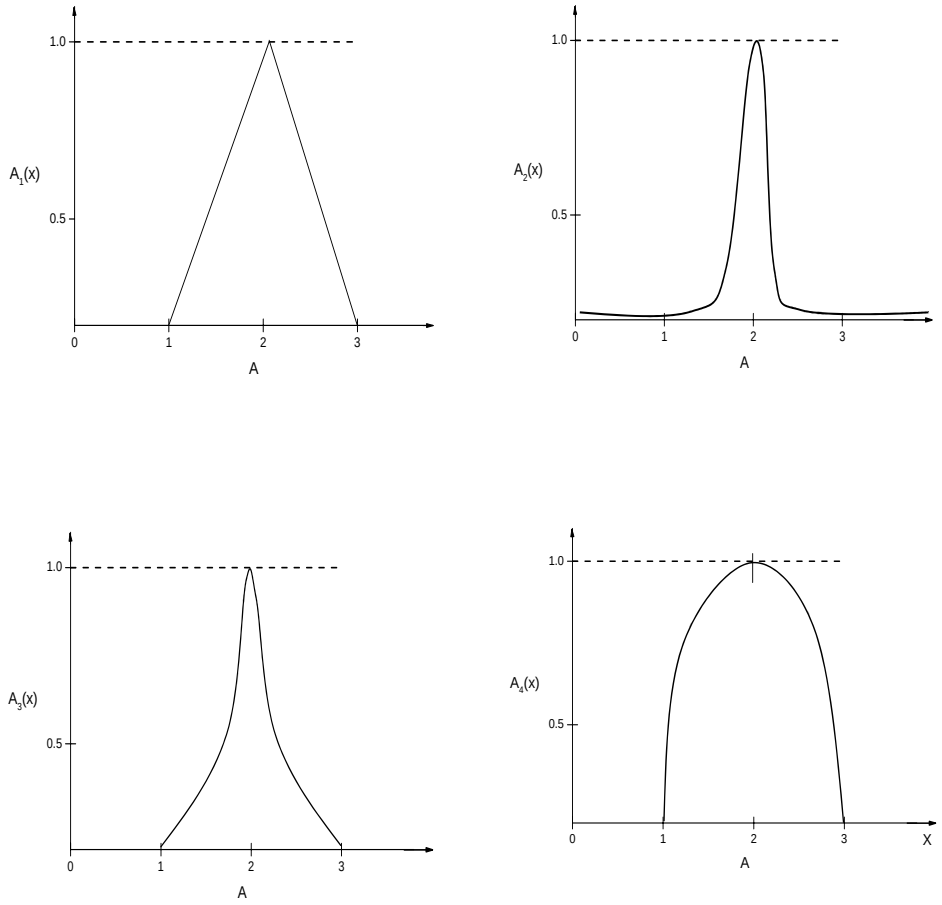


**Fig 2.1- Examples of membership functions that may be used in different contexts for characterizing fuzzy sets of real numbers close to 2**

The functions are manifested by very different shapers of their graphs. Whether a particular shape is suitable or not can be determined only in the context of a particular application. It turns out, however that many applications not overly sensitive to variations in the shape. In such cases, it is convenient to use a sample shape, such as the triangular shape of $A_1$.

Each function in fig.2.1 is a member of a parameterized family of functions. The following are general formulas describing the four families of membership functions, where r denotes the real number for which the membership grade is required to be one (r = 2 all functions in fig 2.1) and $p_i$ ($i \in N_4$) is a parameter that determines the rate at which, for each $\chi$, the function decreases with the increasing difference $|r - x|$:

$$A_1(x) = \begin{cases} p_1(x - r) + 1 & \text{when } x \in [r\text{-}1/p_1, r] \\ p_1(r - x) + 1 & \text{when } x \in [r\text{-}1/p_1, r] \\ 0 & \text{otherwise} \end{cases}$$

$$A_2(x) = \left( \frac{1}{1 + p_2 (x - r)^2} \right)$$

$$A_3(x) = e^{-|p_3(x-r)|}$$

$$A_4(x) = \begin{cases} (1+\cos(p_4\pi(x-r)))/2 & \text{when } x \in [r\text{-}1/p_4,\ r+1/p_4] \\ 0 & \text{otherwise} \end{cases}$$

For each $i \in N_4$, when $p_i$ increases the graph of $A_i$ becomes narrower. Functions in Fig.2.1 exemplify these classes of functions for $p_1 = 1$, $p_2 = 10$, $p_3 = 5$, $p_4 = 2$ and $r = 2$.

Fuzzy sets in Fig.2.1 are defined within the set of real numbers. Fuzzy sets also can be defined within any finite universal set.

**Example (1)** Modeling the fuzzy concept "young" and "old"

Let the set of all possible ages of people be the positive real numbers. One such model, decided upon by a teen ager is,

$$A(x) = \begin{cases} 1 & \text{if} \quad x < 25 \\ \frac{40 - x}{15} & \text{if} \quad 25 \le x \le 40 \\ 0 & \text{if} \quad 40 < x \end{cases}$$

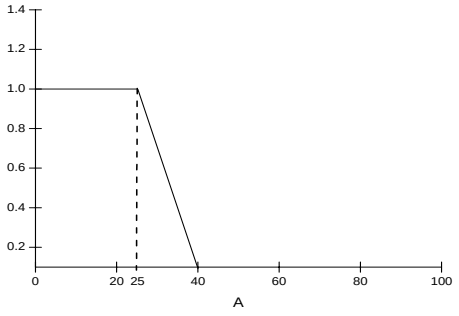


**Fig 2.2 - Membership function for "young" A (*x*)**

Here the definition for young is age is less than 25. If we consider less than 40 is always young, the model should be

$$B(x) = \begin{cases} 1 & \text{if} \quad x < 40 \\ \frac{80 - x}{40} & \text{if} \quad 40 \le x \le 60 \\ \frac{70 - x}{20} & \text{if} \quad 60 < x < 70 \\ 0 & \text{if} \quad 70 \le x \end{cases}$$

The corresponding fig. is

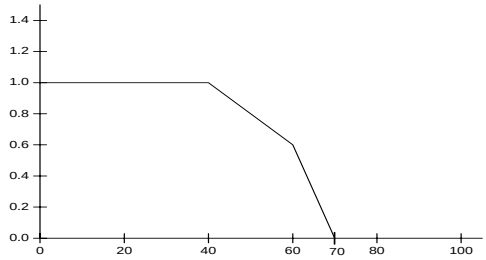


**Fig 2.3 - Membership function for young B(*x*)**

There are various ways to get reasonable membership functions. Suppose we want to model the notion of "richness" with a fuzzy set. Let us suppose that the monthly average income has less than Rs.50,000 is not high, and that if it is more than 2 lakhs them it is "high income", the membership function would be

$$H(x) = \begin{cases} 0 & \text{if} \quad x < 50{,}000 \\ \frac{x - 50{,}000}{1{,}50{,}000} & \text{if} \quad 50{,}000 \le x \le 2{,}00{,}000 \\ 1 & \text{if} \quad 2{,}00{,}000 < x \end{cases}$$

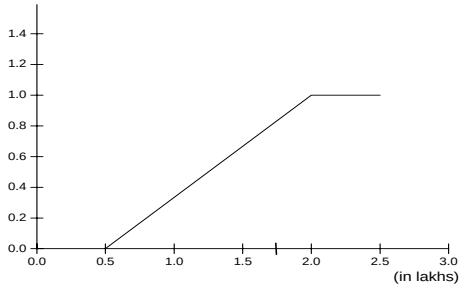


**Fig 2.4 - Membership function for richness**

Fuzzy sets representing linguistic concepts such as low, medium, high etc. are often employed to define states of a variable. Such a variable is called a fuzzy variable. The rainfall within any range (in cms.) can be characterized as a fuzzy variable and it can be contrasted with comparable traditional (non fuzzy) variable. States of the fuzzy variable are fuzzy sets representing the linguistic concepts: very low, low, medium, high, very high. They are all defined by membership functions of the form:

$$[R_1, R_2] \rightarrow [0,1]$$

Graphs of these functions have trapezoidal shapes, which, together with triangular shapes, are most common in current applications. The states of the corresponding traditional variable are crisp sets defined by the right-open intervals of real numbers shown below.

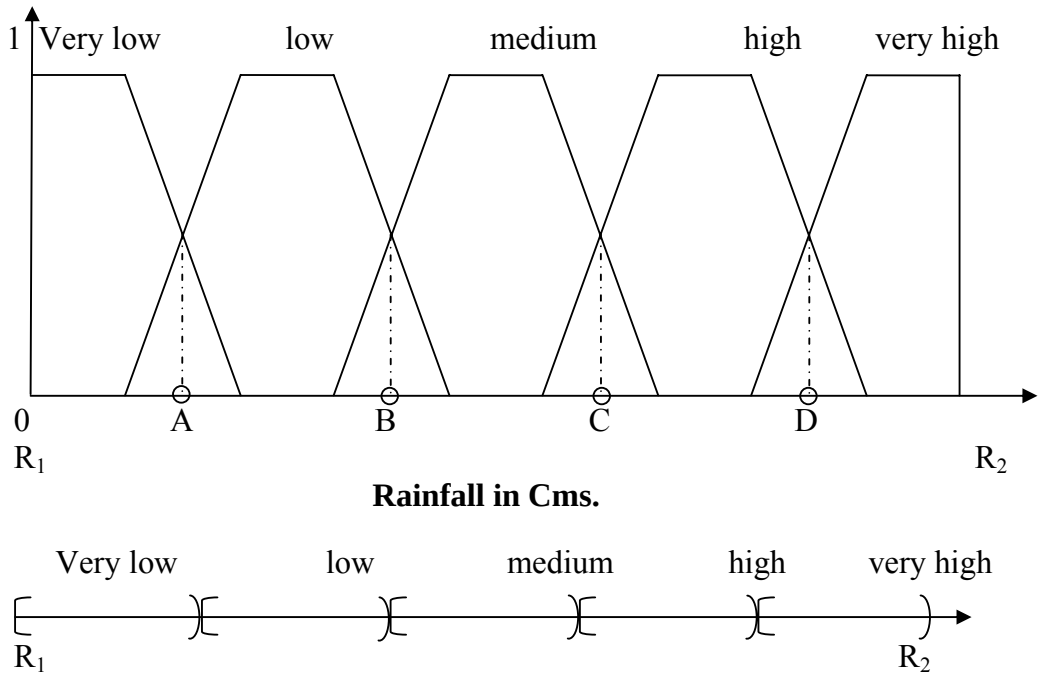


**Fig 2.5 - Rainfall in the range $[R_1, R_2]$ conceived as**
**a) a fuzzy variable (b) a traditional (crisp) variable**

The significance of fuzzy variables is that they facilitate gradual transitions between states and consequently, posses a natural capability to express and deal with observation and measurement uncertainties. The crisp (traditional) variable does not have this capability.

Since fuzzy variable capture measurement uncertainties as part of experimental data, they are more attuned to reality than crisp variables. It is really a paradox that data based on fuzzy variables provide us, infact, with more accurate evidence about real phenomena than data based upon crisp variables. This important point is expressed by Albert Einstean in 1921: *So far as laws of mathematics refer to reality they are not certain. And so far as they are certain they do not refer to reality.*

**Fuzzy Arithmetic**

**Operations on Fuzzy Sets**

**a) Fuzzy operations**

Suppose we have a membership function representing the concepts of a young, middle – aged and old person by,

$$A_1(x) = \begin{cases} 1 & \text{when} \quad x \leq 20 \\ (35 - x)/15 & \text{when} \quad 20 < x < 35 \\ 0 & \text{when} \quad x \geq 35 \end{cases}$$

$$A_2(x) = \begin{cases} 0 & \text{when either} \quad x \leq 20 \text{ or } \geq 60 \\ (x - 20)/15 & \text{when} \quad 20 < x < 35 \\ (60 - x)/15 & \text{when} \quad 45 < x < 60 \\ 1 & \text{when} \quad 35 \leq x \leq 45 \end{cases}$$

$$A_3(x) = \begin{cases} 1 & \text{when} \quad x \leq 45 \\ (x - 45)/15 & \text{when} \quad 45 > x < 60 \\ 0 & \text{when} \quad x \geq 60 \end{cases}$$

The graphical representation is given by

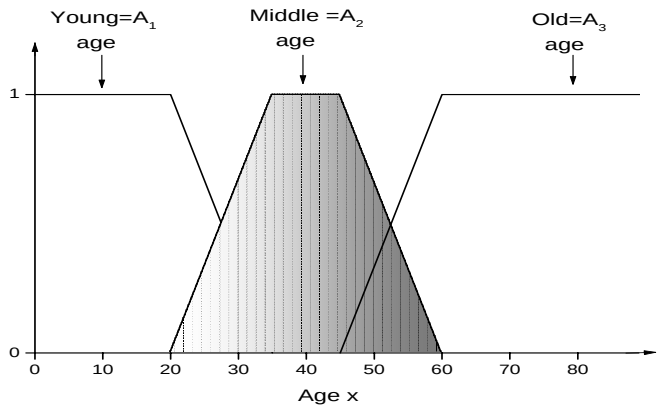


**Fig 2.6**

Now applying the standard operations to the fuzzy sets in fig 2.6 we can find for example that,

$A_2 = \bar{A}_1 \cap \bar{A}_3$

The construction of $\bar{A}_1 \cap \bar{A}_3$ is shown in Fig 2.7 below,

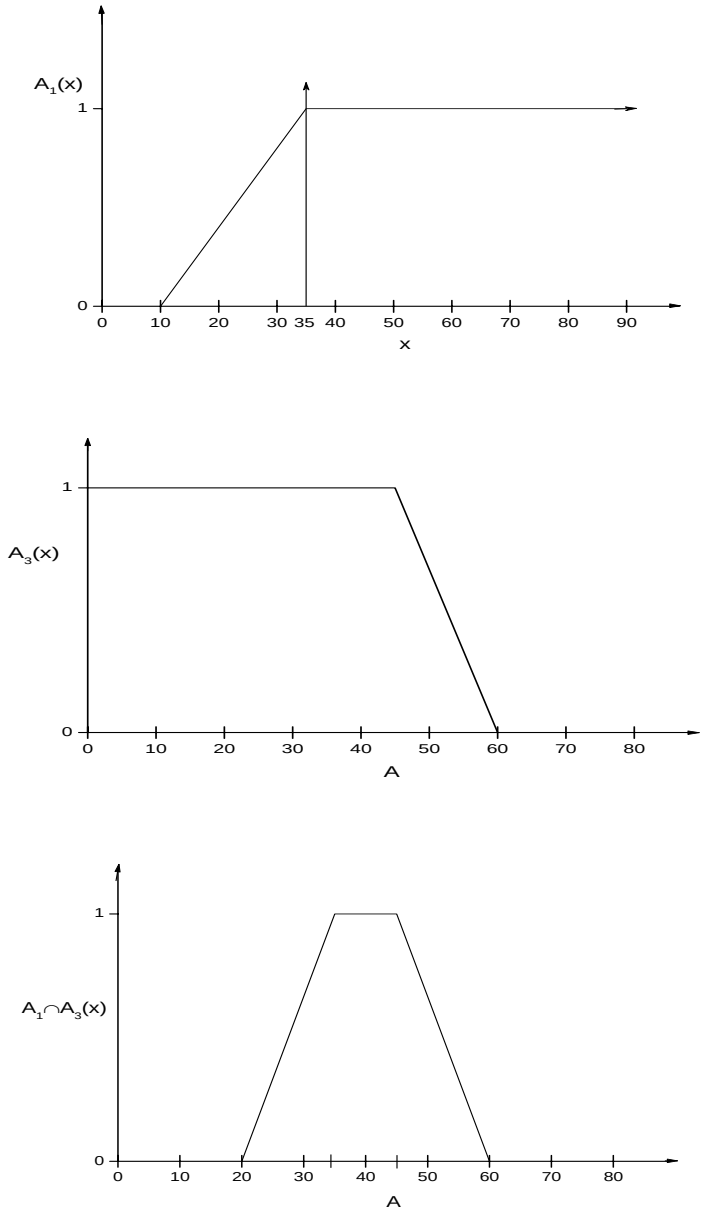


**Fig 2.7**
**Illustration of standard operation on Fuzzy sets**
**($A_1$,$A_2$,$A_S$ are given in fig 2.6)**

The equation makes good sense: a person who is not young and not old is a middle aged person.

**The Analytic Hierarchy Process (AHP)**

The first step in establishing the priorities of elements in a decision problem is to make pairwise comparisons – that is, to compare the elements in pairs against a given criterion. For pairwise comparisons, a matrix is a preferred from. It is a simple well – established tool that offers a framework for testing consistency, obtaining additional information through making all possible comparisons, and analyzing the sensitivity of overall priorities to changes in judgement. This approach uniquely reflects to dual aspects of priorities dominating and dominated.

To begin the pairwise comparison process, start at the top of the hierarchy to select the criterian C, on property that will be used for making the first comparison. Then, from the level immediately below, take the elements to be compared: $A_1$, $A_2$, $A_3$, ….. and so on. Let us suppose that there are seven elements. Arrange these elements in a matrix as in Matrix 3.1

**Matrix 3.1**

| C | $A_1$ | $A_2$ | $A_3$ | - | - | - | $A_7$ |
|---|---|---|---|---|---|---|---|
| $A_1$ | 1 | 5 | - | - | - | - | - |
| $A_2$ | 1/5 | 1 | - | - | - | - | - |
| . | | | | | | | |
| . | | | | | | | |
| . | | | | | | | |
| $A_7$ | - | - | - | - | - | - | 1 |

Now compare the elements $A_1$ in column on the left with the elements $A_1$, $A_2$, $A_3$, … and so on in the row on top with respect to property C in the upper left hand corner. Then repeat with column element $A_2$ and so on. To compare elements, ask: How much more strongly does the element (or activity) possess – or contribute to, dominate, influence, satisfy, or benefit – the property than does the element with which it is being compared.

To fill in the matrix of pairwise comparisons, we use numbers to represent the relative importance of one element over another with respect to the property. Table 3.1 contains the fundamental scale of the AHP for pairwise comparisons.

This scale defines and explains the values 1 through 9 assigned to judgements in comparing pairs of like elements in each level of a hierarchy against a criterion in the next higher level. Experience has confirmed that a

scale of nine units is reasonable and reflects the degree to which we can discriminate the intensity of relationships between elements. The numerically translated judgements are approximations: their validity can be evaluated by a test of consistency. When tradeoffs is to be made among several criteria, the problem of raking becomes complex. It is no longer sufficient to simply to assign arbitrary numbers. We must select with care the numbers used to express the strength with which each element possesses or contributes to the property in question. Such care ensures that in the end we obtain the correct overall priorities for the elements by considering all tradeoffs. (These priorities can also then are used to allocate resources).

### 3.7 Deriving Priorities

To derive the priorities for a group of pairwise comparisons such as for the matrix in 3.1 a decision problem, we have to synthesize the judgements made in the pairwise comparisons that is we have to do some weighting and adding to give us a single number to indicate the priority of each element. The following example explains how to derive priorities from judgements.

Suppose we want to decide which of three new two wheelers – $B_1$, $B_2$, $B_3$ to buy on the basis of comfort, mileage, road grip etc. We draw a matrix with "comfort" listed in the upper left – hand corner and the blikes listed in the column on the left and in a row on top (Matrix 3.2). We then put 1's in the diagonal positions.

**Matrix 3.2 Simple matrix comparing 3 brands of two wheelers for comfort**

| Comfort | $B_1$ | $B_2$ | $B_3$ |
|---|---|---|---|
| **Brand 1 ($B_1$)** | **1** | ½ | ¼ |
| **Brand 2 ($B_2$)** | **2** | **1** | ½ |
| **Brand 3 ($B_3$)** | **4** | **2** | **1** |

This matrix has nine entries to fill. Three are already committed to 1's. Only the three judgments above the diagonal of 1's needs to be made. The judgments below are their reciprocals. In general, if the matrix deals with, say, seven elements, the number of judgments needed to fill the entries in (7 x 7) –

$7 \div 2 = 21$. As seen from the matrix $B_2$ is more comfortable than $B_1$ and $B_3$ is the most preferable.

Now we synthesize the judgments to get an appropriate estimate of the relative priorities of these vehicles with respect to comfort. To do so we first add the values in each column. This is presented in matrix 3.3. Now we divide each entry in each column by the total of that column to obtain the normalized matrix which permits meaningful comparison among elements (matrix 3.4)

**Matrix 3.3 Synthesizing the judgments**

| **Comfort** | **$B_1$** | **$B_2$** | **$B_3$** |
|---|---|---|---|
| **$B_1$** | 1 | ½ | ¼ |
| **$B_2$** | 2 | 1 | ½ |
| **$B_3$** | 4 | 2 | 1 |
| **Total** | 7 | 7/2 | 7/4 |

**Matrix 3.4 Normalized Matrix**

| **Comfort** | **$B_1$** | **$B_2$** | **$B_3$** |
|---|---|---|---|
| **$B_1$** | $^1/_7$ | $^1/_7$ | $^1/_7$ |
| **$B_2$** | $^2/_7$ | $^2/_7$ | $^2/_7$ |
| **$B_3$** | $^4/_7$ | $^4/_7$ | $^4/_7$ |

$$\frac{^1/_7 + ^1/_7 + ^1/_7}{3} = ^1/_7 = 0.14$$

$$\frac{^2/_7 + ^2/_7 + ^2/_7}{3} = ^2/_7 = 0.29$$

$$\frac{^4/_7 + ^4/_7 + ^4/_7}{3} = ^4/_7 = 0.57$$

Finally, we average over the rows by adding the values in each row of the normalized matrix and dividing the rows by the number of entries in each. This synthesis yields the percentages of the overall relative priorities, or preference for $B_1$, $B_2$, $B_3$ : 14, 29 and 57 percent respectively. As for as the comforts are considered $B_2$ and $B_3$ are about 2 times and 4 times more preferable than $B_1$.

Table 3.1

**The fundamental scale for par-wise comparisons**

| Intensity of Importance | Definition | Explanation |
|---|---|---|
| 1 | Equal importance | Two activities contribute equally to the objective |
| 3 | Moderate importance | Experience and judgement slightly favour one activity over another |
| 5 | Strong importance | Experience and judgement strongly favour one activity over another. |
| 7 | Very strong or demonstrated importance | An activity is favoured very strongly over another; its dominance demonstrated in practice |
| 9 | Extreme importance | The evidence favouring one activity over another is of the highest possible order of affirmation |
| 2,4,6,8 | For compromise between the above values | Sometimes one needs to interpolate a compromise judgement numerically because there is no good work to describe it. |
| Reciprocals of above | If activity I has one of the above non zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i | A comparison mandated by choosing the smaller element as the unit to estimate the larger one as a multiple of that unit |
| Rational | Ratios arising from the scale | If consistency were to be forced by obtaining ‘n’ numerical values to span the matrix |
| 1.1 to 1.9 | For tied activities | When elements are close and nearly indistinguishable; moderate is 1.3 and extreme is 1.9 |

### 3.7.1 Calculation of priorities using the exact method

Here the priorities are obtained from the matrix of paired comparisons and its accompanying Fig 3.3 by calculating the total dominance of each of the activities A, B, C represented by the judgments in a row, the first row represents activity A and so-on.

Let the consistent matrix of judgments be:

| | A | B | C | D |
|---|---|---|---|---|
| **A** | **1** | **2** | **2** | **4** |
| **B** | **½** | **1** | **1** | **2** |
| **C** | **½** | **1** | **1** | **2** |
| **D** | **¼** | **½** | **½** | **1** |

The value of 2 in the first row and second column represents the dominance of a on the left over B on the top. It is equal to 4 in first row and fourth column comparing A with D multiplied by the value ½ in the fourth row and second column comparing D with B. In other words, here the dominance of A over B also be obtained indirectly from A to D to B. The dominance of A over C in the first row and third column which is 2 multiplied by the dominance of C over B which is one in the 3rd row, 2nd column.

**Extending the Process**

Now we extend the AHP to fuzzy. These methods are completely different from what has been described earlier. Here a synthetic extent value $S_i$ of the pair wise comparison is introduced, by applying the principle of the comparison of fuzzy numbers. We have the following basic concepts.

**Priority Theory – General case**

Let us now consider a decision problem with n factors $F_1, F_2 \ldots F_n$. Now we have to obtain estimates of the positive weights $w_1, w_2 \ldots w_n$ of these factors which assumed to be normalized in the sense $\sum_{i=1}^{n} w_i = 1$. Suppose a matrix $R = (r_{ij})$ is available where $r_{ij}$ is an estimate for the relative significance of the factors $F_i$ and $F_j$.

ie, for $w_i/w_j$. We assume that R is a reciprocal matrix,

ie, $r_{ij}. r_{ij} = 1$, i,j=1,2,….n

Now there are several methods of obtaining estimates for the weights $w_1, w_2, \ldots w_n$ from the matrix R as already discussed. Another method for this is the method of logarithmic regressions. It is suitable for extension to the situation in which multiple comparisons for pairs of factors are available. The

method is as follows. We estimate the vector w by the –normalized vector α, which minimizes

$$\sum_{i<j} (l_n r_{ij} - l_n (\alpha_i/\alpha_j))^2 \qquad \ldots\ldots(1)$$

Under additional conditions (normalization) this results in estimating $w_i$ by the corresponding normalized row mean. Suppose the matrix R has empty cells ($r_{ij}$ not available) or cells with more than one entry (several $r_{ij}$' is available). Such situation can occur, when several decision – makers express their opinion on the relative significance of a pair of factors. In this case we estimate w by the normalized vector, which minimizes

$$\sum_{i<j} \sum_{k=1}^{\delta ij} \left(l_n r_{ijk} - l_n(\alpha_i/\alpha_j)\right)^2$$

Where $r_{ijk}$ (k=1,2, ….. $\delta_{ij}$) are $\delta_{ij}$ estimates for $w_i/w_j$ ($\delta_{ij}$ can be equal to 0, if no comparisons are available equal to one or greater than one, in which case there are multiple comparisons) and where we have taken (1) in to account.

If we put $y_{ijk} = l_n r_{ijk}$, we minimize

$$\sum_{i<j} \sum_{k=1}^{\delta ij} (y_{ijk} - x_i + x_j)^2$$

by solving the associated normal equation.

$$x_i \sum_{\substack{j=1 \\ j\neq i}}^{n} \delta_{ij} - \sum_{\substack{j=1 \\ j\neq i}}^{n} \delta_{ij} \quad x_j = \sum_{\substack{j=1 \\ j\neq i}}^{n} \sum_{k=1}^{\delta ij} y_{ijk}\,, \; i=1,2, \ldots..n. \text{ for } x_i \qquad \ldots.. (A)$$

Taking the exponentials of the $x_i$ and normalizing them, we obtain estimates for the $w_i$(i=1,2,….n)

In a concrete situation, the $r_{ij}$'s are usually taken between 5 and 1/5: $r_{ij}$ is set to 5, if $F_i$ is felt to be much more important than $F_j$, it is set to 3 if $F_i$ is felt to be more important than $F_j$ and if $r_{ij}$ = 1, $F_i$ and $F_j$ are considered to be equally important. Intermediate values can be assigned to $r_{ij}$ in case of doubt between two adjacent values. If $F_i$ is important than, $F_j$, we have $r_{ij}<1$ and, as was already mentioned, we assume $r_{ij}\, r_{ij} = 1$ ($\forall$ i,j). Now, the essence of the method is to replace the $r_{ij}$'s by fuzzy numbers, since it is more realistic to set $r_{ij}$ to "about three" – if $F_j$ – than to put $r_{ij}$ = 5. Thus we have to solve a linear system like (A) with fuzzy right – hand sides. Now we shall pay a little attention to fuzzy numbers before presenting the method of solving.

**Triangular fuzzy numbers**

**Definition 1**

Let M ∈ F(R) be called a fuzzy number if,

a) There exists $x_o \in R$ such that $\mu_M(x_0) = 1$

b) For any $\alpha \in [0,1]$

$A = [x, \mu_A(x_0) \geq \alpha]$ is a closed interval.

Here F(R) represents all fuzzy sets and R is the set of all real numbers.

**Definition 2**

We define a fuzzy number M on R = (-∞, +∞) to be a triangular fuzzy number if its membership function $\mu_M$: R → [0,1] is equal to,

$$\mu_M(x) = \begin{cases} \frac{1}{m-l}x - \frac{l}{m-l}, & x \in [l,m], \\ \frac{1}{m-l}x - \frac{l}{m-l}, & x \in [m,u], \\ 0, & \text{otherwise} \end{cases}$$

With $l \leq m \leq u$, $l$ and u stand for the lower and upper value of the support of M, respectively, and m for the modal value. The triangular number as given in (1), will be denoted by ($l$,m,u), see fig.3.4. The support of M is the set of elements $\{x \in R \mid l < x < u\}$.

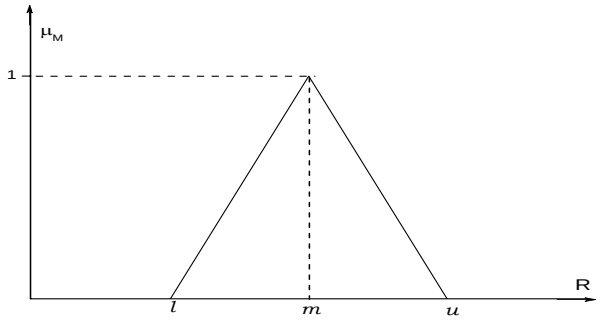


**Fig 3.4 Membership function of a triangular fuzzy number, M = ($l$,m,u).**

For any two fuzzy numbers M and N, defined by their membership $\mu_M$ and $\mu_N$ the membership function of the fuzzy number,

T = f (M,N) is calculated according to the extension principles as

$$\mu_T(z) = \sup_{(x,y) \in R^2 : Z = (x,y)} (\min(\mu_M(x), \mu_N(y))) \quad \ldots..(2)$$

Using the above we present the operations on the triangular fuzzy numbers.

**Addition and multiplication**

Consider two triangular fuzzy numbers $M_1 = (l_1, m_1, u_1)$ and $M_2 = (l_2, m_2, u_2)$.

Equation (2) implies

- for addition

$$\mu_{M_1 \oplus M_2}(Z) = \sup_{(x,y) \in R^2 : Z = x+y} (\min(\mu_{M_1}(x), \mu_{M_2}(y))) \quad \ldots..(3)$$

$$= \sup_{x \in R} (\min(\mu_{M_1}(x), \mu_{M_2}(z-x)),$$

- for multiplication

$$\mu_{M_1 \odot M_2}(Z) = \sup_{(x,y) \in R^2 : Z = x.y} (\min(\mu_{M_1}(x), \mu_{M_2}(y))) \quad \ldots..(4)$$

$$= \sup_{x \in R} (\min(\mu_{M_2}(x), \mu_{M_2}(\tfrac{z}{x})))$$

Since the sum $M_1 \oplus M_2$ and product $M_1 \odot M_2$ are continuous fuzzy numbers, whose membership functions are 'onto; we can carry out the construction separately on the increasing and decreasing parts of the membership function. Thus for addition,

- for increasing parts and fixed $w \in [0,1]$ there exists $x,y \in R$, satisfying the equations

$$w = \mu_{M_1}(x) = \mu_{M_2}(y) \quad \ldots(5)$$

Thus we obtain

$$z = x+y = w(m_1+l_1)+l_1+w(m_2+l_2)+l_2$$

$$= w(m_1+ m_2 - l_1 - l_2)+l_1+ l_2 \quad \ldots(6)$$

- for decreasing parts equations (5) result in

$$z = x+y = w(m_1+ m_2 - u_1 - u_2)+u_1+u_2 \quad \ldots(7)$$

Now, using the same technique as in original triangular fuzzy, we have via,

$$w = \mu_{M_1 \oplus M_2}(Z) \quad :$$

-if $m_1 - l_1 + m_2 - l_2 \le z \le m_1 + m_2$:

$$\mu_{M_1 \oplus M_2}(Z) = \frac{1}{m_1 - l_1 + m_2 - l_2} z - \frac{l_1 + l_2}{m_1 - l_1 + m_2 - l_2} \quad \ldots\ldots(8)$$

if $m_1 + m_2 \le z \le m_1 + u_1 + m_2 + u_2$

$$\mu_{M_1 \oplus M_2}(Z) = \frac{1}{m_1 - u_1 + m_2 - u_2} Z - \frac{u_1 + u_2}{m_1 - u_1 + m_2 - u_2} \quad \ldots\ldots(9)$$

Hence we get

$$(l_1, m_1, n_1) \oplus (l_2, m_2, n_2) = (l_1 + l_2, m_1 + m_2, u_1 + u_2) \quad \ldots..(10)$$

For multiplication of fuzzy numbers we have:

- for increasing part ($w \in [0,1]$):

$$z = xy = F_1(w) = (l_1 + w(m_1 - l_1))(l_2 + w(m_2 - l_2))$$
$$= (l_1 l_2 + w l_2(m_1 - l_1) + w l_2(m_2 - l_2) + w^2 (m_1 - l_1)(m_2 - l_2) \quad (11)$$

For decreasing part ($w \in [0,1]$):

$$z = xy = F_2(w) = (u_1 + w(m_1 - u_1))(u_2 + w(m_2 - u_2))$$
$$= u_1 u_2 + w u_2(m_1 - u_1) + w u_2(m_2 - u_2) + w^2 (m_1 - u_1)(m_2 - u_2) \quad (12)$$

This implies that:

- if $l_1 l_2 \le z \le m_1 m_2$ then $\mu_{M_1 \odot M_2}(Z) = F_1((z)$;
- if $m_1 m_2 \le z \le u_1 u_2$ then $\mu_{M_1 \odot M_2}(Z) = F_2((z)$;

It is obvious that $M_1 \odot M_2$ is infact, not a triangular fuzzy number. Accepting the following approximation formula,

$$(l_1, m_1, u_1) \odot (l_2, m_2, u_2) \approx (l_1 l_2, m_1 m_2, u_1 u_2) \quad \ldots..(13)$$

It provides a triangular fuzzy number, which coincides with $M_1 \odot M_2$ at the interval $(-\infty, l_1 l_2]$, $\{m_1, m_2\}$, $[u_1 u_2, \infty)$; see fig.3.5

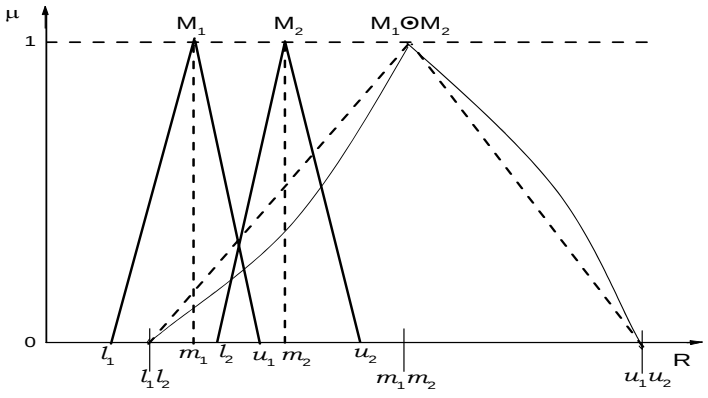


**Fig: 3.5 Membership functions of the triangular fuzzy numbers $M_1$ and $M_2$ and of $M_1 \odot M_2$ and its approximation**

**b) Inverse:** Bearing in mind the equation

$$\mu_{M^{-1}}(x) = \mu_M(x^{-1}) = (x \neq 0) \quad \ldots..(14)$$

And equation (1), we get

$$\mu_M(x) = \begin{cases} \frac{1}{(m-u)x} - \frac{u}{(m-u)}, & x \in [\frac{1}{u}, \frac{1}{m}] \\ \frac{1}{(m-u)x} - \frac{l}{(m-l)}, & x \in [\frac{1}{m}, \frac{1}{l}] \\ 0, & \text{otherwise} \end{cases} \quad \ldots..(15)$$

Calculating values x, $x_{01}$ and $x_{02}$ which satisfy

$\mu_M^{-1}(x_{01}) = \mu_M^{-1}(x_{02}) = 0$, we have $x_{01} = \frac{1}{u}$ and $x_{02} = \frac{1}{l}$

and thus we obtain the following approximation formula,

$$(l,m,u)^{-1} \simeq (\frac{1}{u}, \frac{1}{m}, \frac{1}{l}) \quad \ldots..(16)$$

**c) Logarithm**

In the same way as before, we get

$$\mu_M(x) = \begin{cases} \frac{1}{(m-l)} e^x - \frac{l}{(m-l)}, & x \in [l_n l, l_n m] \\ \frac{1}{(m-u)} e^x - \frac{u}{(m-u)}, & x \in [l_n m, l_n u] \\ 0, & \text{otherwise} \end{cases} \quad \ldots..(17)$$

And $l_n(l,m,u) \simeq (l_n l, l_n m, l_n u)$ $\ldots..(18)$

**d) Exponential**

Taking into account the equation

$\mu_{e^m}(x) = \mu_{e^m}(l_n x)$ $\ldots..(19)$

We can calculate

$$\mu_{e^m}(x) = \begin{cases} \frac{1}{(m-l)} l_n x - \frac{l}{(m-l)}, & x \in [e^l, e^m] \\ \frac{1}{(m-u)} l_n x - \frac{u}{(m-u)}, & x \in [e^m, e^u] \\ 0, & \text{otherwise} \end{cases} \quad \ldots..(20)$$

An approximation formula takes the form

$e^{(l,m,u)} \simeq (e^l, e^m, e^u)$ $\ldots..(21)$

**e) Multiplication consant**

$(\lambda, \lambda, \lambda) \odot (l_1, m_1, u_1) = (\lambda l_1, \lambda m_1, \lambda u_1), \lambda > 0, \lambda \in R$ $\ldots..(22)$

Consider two triangular fuzzy numbers $M_1$ and $M_2$, $M_1 = (l_1, m_1, u_1)$ and $M_2 = (l_2, m_2, u_2)$.

Their operational laws are as follows:

1. $(l_1, m_1, u_1) \oplus (l_2, m_2, u_2) \approx (l_1+l_2, m_1+m_2, u_1+u_2)$
2. $(l_1, m_1, u_1) \odot (l_2, m_2, u_2) \approx (l_1l_2, m_1m_2, u_1u_2)$
3. $(\lambda, \lambda, \lambda) \odot (l_1, m_1, u_1) \approx (\lambda l_1, \lambda m_1, \lambda u_1), \lambda > 0, \lambda \in R$
4. $(l_1, m_1, u_1)^{-1} \approx (\frac{1}{u_1}, \frac{1}{m_1}, \frac{1}{l_1})$

**3.8.2 Fuzzy priority theory:**

Consider the decision – problem discussed in 3.8 (a). Now assume that we estimate the ratio $w_i/w_j$ by a fuzzy number $\tilde{r}_{ij}$. Here we distinguish between $\tilde{r} = (l, m, u)$ where $l \leq m \leq u$ and $r = (l, m, u)$ where $l \leq m \leq u$ does not necessarily hold. We denote $\tilde{r}_{ij}$ again by $(l_{ij}, m_{ij}, u_{ij})$ where $l_{ij}$, $m_{ij}$ and $u_{ij}$ are again the lower, modal and upper value of $r_{ij}$, respectively. Thus, we are given a fuzzy matrix $\tilde{R} = (\tilde{r}_{ij})$ and we want to obtain fuzzy, estimates for the weights $w_1, w_2, \ldots\ldots w_n$ from the matrix. Proceeding as before we finally obtain the linear system of equations (A) again however, the $\tilde{x}_i$ $(l_i, m_i, u_i)$ and $\tilde{y}_{jk} = (l_{ijk}, m_{ijk}, u_{ijk}) = l_n \tilde{r}_{jk}$ are fuzzy numbers now. Keeping in mind the rules for addition and subtraction of fuzzy numbers given in 3.8(a), we observe that system (A) in its fuzzy version is equivalent to

$$l_i \sum_{\substack{j=1 \\ j\neq i}}^{n} \delta_{ij} - \sum_{\substack{j=1 \\ j\neq i}}^{n} \delta_{ij} \quad u_j = \sum_{\substack{j=1 \\ j\neq i}}^{k} \sum_{k=1}^{\delta ij} l_{ijk}, \; i=1,2, \ldots..n. \qquad \ldots..(23)$$

$$m_i \sum_{\substack{j-1 \\ j\neq i}}^{n} \delta_{ij} - \sum_{\substack{j-1 \\ j\neq i}}^{n} \delta_{ij} \quad m_j = \sum_{\substack{j-1 \\ j\neq i}}^{n} \sum_{k=1}^{\delta ij} m_{ijk}, \; i=1,2, \ldots..n. \qquad \ldots..(24)$$

$$u_i \sum_{\substack{j=1 \\ j\neq i}}^{r} \delta_{ij} - \sum_{\substack{j=1 \\ j\neq i}}^{r} \delta_{ij} \quad l_j = \sum_{\substack{j=1 \\ j\neq i}}^{n} \sum_{k-1}^{\delta ij} u_{ijk}, \; i=1,2, \ldots..n. \qquad \ldots..(25)$$

as $l_{ijk}$ and $u_{ijk}$ are lower and upper values of $ln\ \tilde{r}_{jik} = -l_n \tilde{r}_{jik}$,

$l_{ijk} + l_{ijk} = u_{ijk} + u_{ijk} = 0$ (for i, j=1, …..n, k=1,2, $\delta_{ij}$)

and thus equations (23) and (25) sum up to zero and are linearly dependent. The same is true for (24) also.

Generally, a solution of (23) – (25) is given by,

$$x_i = (l_i+p_1, m_i+p_2, u_i+p_1), \; i= 1,2,\ldots..n. \qquad \ldots..(26)$$

where $p_1$ and $p_2$ can be chosen arbitrarily.

Now, we have the following:

**Remarks:**

(1) One is not always able to choose the parameters $p_1$ and $p_2$ such that,

$l_i+p_1 \leq m_i+p_2 \leq u_i+p_1$, i= 1,2,…..n …..(27)

However, it is the experience that after taking the exponentials and after normalizing, the resulting fuzzy numbers $\tilde{a}_i$ are correct again, in the sense that lower value < model value < upper value. However, we have not been able to prove that it is always like this. Thus, one should see (26) as a calculation formula than as a fuzzy number.

(2) One may find a double dependency in the linear systems (23) and (25). This is eg. The case, when n or n-1 rows in the matrix $\tilde{R}$ have, apart from the diagonal element, only one other element. Examples, of such matrices can be seen in the illustration given in matrices $R_2$ and $R_4$. In such cases we have three (arbitrary) parameters $p_1$, $p_2$ and $p_3$ in equation (26) and he problems is, that, after taking the exponential and normalizing, the parameters $p_1$, $p_3$ do not fall out any more. Thus the calculations do not yield a unique solution. However, by putting $p_1=p_3$, the parameters do fall out again and we have a unique solution. We must emphasize; however that there is no theoretical justification for putting $p_1=p_3$.

A possible way to overcome these difficulties could be the following. It is commonly known that the solution of an undetermined system A*x*=b to which the smallest Euclidean norm is given by

In our case, we have to solve the under determined system:

($\tilde{x}$ and $\tilde{y}$ fuzzy vectors) as given by (23) – (25). Analogous to the non-fuzzy case, a minimum-norm solution would be given by

Thus $\tilde{x}$ would always be a correct fuzzy number (correct in the sense that lower value < modal value < upper value) and one would obtain a solution for the case mentioned in Remark (2). However, this solution cannot always be a solution to (29), since this would exclude the situation mentioned in Remark (1) (the reason for this fact is that for a triangular fuzzy number $\tilde{y}$ generally)

$A(A^T(AA^T)^{-1}\tilde{y} \neq \tilde{y}$, if the matrix A has negative entries.

Taking the exponentials of (26) and following the fuzzy rules, we obtain

$$\beta_i = \exp(x_i) = (\exp(l_i+p_1), \exp(m_i+p_2), \exp(u_i+p_1)),\ i= 1,2,\ldots \quad \ldots(31)$$

If we normalize the $\beta_i$; ie if we define $\tilde{\alpha}_i$ by

$$\tilde{\alpha}_i = \beta_i \left(\sum_{i=1}^{n} \beta_i\right)^{-1},\ i=1,2\ldots..n \quad \ldots\ldots(32)$$

It is easy to check that $\tilde{\alpha}_i$ are given by

$$\tilde{\alpha}_i = (r_1 \exp(l_i), r_2\exp(m_i), r_3\exp(u_i)),\ i= 1,2,\ldots..n. \quad \ldots\ldots(33)$$

Where $r_1 = \left(\sum_{i=1}^{n} \exp(u_i)\right)^{-1}$, $r_2 = \left(\sum_{i=1}^{n} \exp(m_i)\right)^{-1}$, $r_3 = \left(\sum_{i=1}^{n} \exp(l_i)\right)^{-1}$

We use $\tilde{\alpha}_i$ as an estimate for $w_i$

Thus we have, fuzzy estimates $\tilde{\alpha}_i$ (i= 1,2…..n) for weights $w_i$ (i= 1,2…..n) are obtained as follows:

(i) For each pair of factors $F_i$ and $F_j$, obtain $\delta_{ij}$ ($\delta_{ij}$= 0,1…) fuzzy estimates for the relative significance of $F_i$ and $F_j$

(ii) Solve the linear system (23) - (25) for $l_i$, $m_i$ and $u_i$ (i=1,2…..n); if the situation mentioned in remark (2) occurs put $p_1 = p_3$ or use (30).

(iii) Use $\tilde{\alpha}_i$ , as given by (33), as an estimate for $w_i$. We shall now illustrate the working of this with the help of our study

**Discrimination**:

It is frequently important in social science research on examining a single individual or a small sample of individuals, to be able to decide in which of the two groups the individuals belongs.

Some time decisions can be made on the basis of a single variable, but more of the two groups differ in several variables, each of which gives some indications as to the group in which the individual should be placed. The problem of utilizing 2 or more variables, however, is obviously, not simple unless either one is sufficient in itself for discrimination, in which case it is superfluous to consider more than one. The general problem is to set up a function of the form

$$Z = \lambda_1x_1+ \lambda_2x_2+\ldots\ldots\ldots\ldots+ \lambda_kx_k \quad \ldots\ldots\ldots\ldots(1)$$

Where $x_i$ are the variables measured and $\lambda_i$ are the corresponding weights. The simplest type of function would be

$$Z = x_1 + x_2 + \ldots\ldots\ldots\ldots + x_k \qquad \ldots\ldots\ldots\ldots(2)$$

Which assumes that the variables have the same mean and are of equal discriminating value. This is not likely to be a best discriminating function, however, as some of the variables may have much more discriminating power than others and should be weighted accordingly.

Hence, fisher has suggested the following: He has shown as how to devise the coefficients of equation (1) such that, if we were to make an ANOVA on Z value, the ratio of the variance between the attributes to that within attributes would be a maximum.

Let us suppose that we have to discriminate 2 groups say A and B and that there are $n_1$ sets of measurements in A and $n_2$ in B;

The coefficient of the discriminant function arises from maximizing the ratio.

$$G = \frac{\bar{Z}_A - \bar{Z}_B}{\sum_1^{n_1}(Z_i - \bar{Z}_A)^2 + \sum_1^{n_2}(Z_y - \bar{Z}_B)^2} \qquad \ldots\ldots\ldots\ldots(3)$$

The numerator of the above ratio is the square of the difference between the means of Z for the 2 group, and the denominator is the sum of the squares within groups. It is known that maximizing the ration G yields a set of simulations equations of the form, assuming 3 variables, $x_1$, $x_2$ and $x_3$ are available in the study

$$\lambda_1 \sum x_1^2 + \lambda_2 \sum x_1x_2 + \lambda_3 \sum x_1x_3 = d_1$$
$$\lambda_1 \sum x_1x_2 + \lambda_2 \sum x_2^2 + \lambda_3 \sum x_2x_3 = d_2$$
$$\lambda_1 \sum x_1x_3 + \lambda_2 \sum x_2x_3 + + \lambda_3 \sum x_3^2 = d_3 \qquad \ldots\ldots\ldots\ldots(4)$$

where $x_1$, $x_2$ and $x_3$ represent deviations from their respective group means represented by $\bar{X}_A$ and $\bar{X}_B$ and

$$d_1 = \bar{X}_{A1} - \bar{X}_{B1}$$
$$d_2 = \bar{X}_{A2} - \bar{X}_{B2}$$
$$d_3 = \bar{X}_{A3} - \bar{X}_{B3} \qquad \ldots\ldots\ldots\ldots(5)$$

The difference $\bar{Z}_A - \bar{Z}_B$ between the means for the groups, represented usually by D, is

$$D = \lambda_1 d_1 + \lambda_2 d_2 + \lambda_3 d_3 \qquad \ldots\ldots\ldots\ldots(6)$$

After computing D, a test can be made of the significance of the discriminant functions by means of the ANOVA, taking

$\left(\frac{n_A n_B}{n_A + n_B}\right) D^2$ = sum of squares between groups for k degrees of freedom, where k = the number of characters measured

D = sum of squares within groups for $n_A + n_B - k - 1$ degrees of freedom

The partitioning of degrees of freedom is similar to that for multiple regressions. The sum of squares for between groups is represented by k degrees of freedom since k of the λ coefficients are calculated from the data and applied as in equation (6) for estimating D.

In the actual calculation are need the correlations between the variables and in this case the use can easily compute the λ values using the correlations in (4)

The correlations needed are

$$r_{12} = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}, \; r_{13} = \frac{\sum x_1 x_3}{\sqrt{\sum x_1^2 \sum x_3^2}}, \; r_{23} = \frac{\sum x_2 x_3}{\sqrt{\sum x_2^2 \sum x_3^2}} \qquad \ldots\ldots(7)$$

Now it is possible to substitute for $\sum(x_1 x_2)$, $\sum(x_1 x_3)$ and $\sum(x_2 x_3)$ in equations (4), and on simplifications we have,

$$\lambda_1^1 + \lambda_2^1 r_{12} + \lambda_3^1 r_{13} = d_1^1$$
$$\lambda_1^1 r_{12} + \lambda_2^1 + \lambda_3^1 r_{23} = d_2^1$$
$$\lambda_1^1 r_{13} + \lambda_2^1 r_{23} + \lambda_3^1 = d_3^1 \qquad \ldots\ldots(8)$$

Where $\lambda_1^1 = \lambda_1 \sqrt{\sum x_1^2}$, $\lambda_2^1 = \lambda_2 \sqrt{\sum x_2^2}$

$\lambda_3^1 = \lambda_3 \sqrt{\sum x_3^2}$ and

$$d_1^1 = d_1 \sqrt{\sum x_1^2}, \; d_2^1 = d_2 \sqrt{\sum x_2^2}, \; d_3^1 = d_3 \sqrt{\sum x_3^2} \qquad \ldots\ldots\ldots (9)$$

finally,

$$D^1 = \lambda_1^1 d_1^1 + \lambda_2^1 d_2^1 + \lambda_3^1 d_3^1 = \lambda_1 d_1 + \lambda_2 d_2 + \lambda_3 d_3 = D \qquad \ldots\ldots\ldots(10)$$

## Performance of Continuously Loss Making PACS

Name of the Society : MD Spl 53 Hanumanthan Patty PACS
Date of Registration : 24.02.1968
Date of Commencement : 31.03.1968
Number of villages in the area of operation : 3

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006 - 07 | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 -12 | A G RATE |
| 1 | No. of Members | 2007 | 2007 | 2007 | 2007 | 2007 | 2007 | 2007 | 2008 | 0.01 |
| 2 | Share Capital position | 3.26 | 3.34 | 3.98 | 4.38 | 4.99 | 6.13 | 6.42 | 6.53 | 9.07 |
| 3 | Borrowings | 99.03 | 111.99 | 105 | 117.43 | 163.73 | 99.27 | 109.27 | 170.42 | 7.02 |
| 4 | Deposits | 2.03 | 2.42 | 3.3 | 4.1 | 4.3 | 5.66 | 5.97 | 6.02 | 14.55 |
| 5 | ST loan outstanding | 17.5 | 13.49 | 12.45 | 15.37 | 25.55 | 38.66 | 57.67 | 74.62 | 19.87 |
| 6 | MT loan outstanding | 3.6 | 3.6 | 1.62 | 1.69 | 0.62 | 0.62 | 0.62 | 0.62 | -19.74 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 2.54 | 1.46 | 5.23 | 2.78 | 22.79 | 68.42 | 70.36 | 107.46 | 59.70 |
| 8 | Other loan outstanding | 17.12 | 10.93 | 7.56 | 10.59 | 16.34 | 10.43 | 5.22 | 7.18 | -10.29 |
| 9 | Total loan outstanding (5+6+7+8) | 40.76 | 29.48 | 26.86 | 30.43 | 65.3 | 118.13 | 133.87 | 189.88 | 21.21 |
| 10 | Distribution of Fertilizer (Value) | 1.66 | 1.96 | 5.23 | 3.99 | 12.89 | 13.4 | 14.12 | 14.28 | 30.87 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.3 | 0.5 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 90% | 53% | 98% | 92.00% | 93% | 94% | 97.00% | 96% | 0.81 |
| 15 | Profit / Loss | -9.41 | -17.37 | -10.91 | 15.04 | 18.57 | -78.38 | 42.54 | -14.44 | 5.50 |
| 16 | Cumulative Loss | -96.93 | -114.8 | 103.89 | -118.93 | 137.5 | 59.12 | -16.58 | -12.14 | -22.87 |
| 17 | No. of Employees | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 5.20 |
| 18 | Total establishment cost | 1.67 | 0.57 | 1.77 | 2.55 | 2.7 | 2.84 | 3.12 | 11.43 | 27.18 |

## Performance of Continuously Loss Making PACS

Name of the Society : M.D.Spl. 23 Kodangipatty PACS
Date of Registration : 24.08.4967
Date of Commencement : 10.04.1968
Number of villages in the area of operation : 5 (Kodangipatty, Sadaiyalpatty, S.Vadipatty, Valayapatty, B.Anakkraipatty)

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 2108 | 2045 | 2045 | 2045 | 2045 | 2045 | 2045 | 1469 | -4.41 |
| 2 | Share Capital position | 7.14 | 7.18 | 7.68 | 8.18 | 9.1 | 9.68 | 10.04 | 9.98 | 4.27 |
| 3 | Borrowings | 166.91 | 183.29 | 149.81 | 171.32 | 218.9 | 75.12 | 122.18 | 121.89 | -3.85 |
| 4 | Deposits | 3.25 | 3.52 | 3.26 | 3.51 | 3.61 | 4.97 | 5.01 | 6.63 | 9.32 |
| 5 | ST loan outstanding | 37.56 | 41.87 | 6.43 | 11.39 | 23.9 | 31.78 | 45.12 | 45.16 | 2.33 |
| 6 | MT loan outstanding | 7.82 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 1.51 | -18.58 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 0 | 1.01 | 14.12 | 34.71 | 51.23 | 95.26 | 140.17 | 140.17 | 0.00 |
| 8 | Other loan outstanding | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 0.00 |
| 9 | Total loan outstanding (5+6+7+8) | 46.42 | 44.39 | 22.06 | 47.61 | 76.64 | 128.55 | 186.8 | 187.88 | 19.10 |
| 10 | Distribution of Fertilizer (Value) | 0 | 1.6 | 3.12 | 8.03 | 48.41 | 41.87 | 26.95 | 32.14 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 23.58 | 27.19 | 22.76 | 23.56 | 32.93 | 35.44 | 42.51 | 44.12 | 8.15 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 19% | 10% | 48% | 28% | 76% | 122% | 215% | 82 | 113.99 |
| 15 | Profit / Loss | -10.73 | -18.85 | 0.17 | -8.96 | 1.5 | 3.3 | 4.6 | 6.17 | 0.00 |
| 16 | Cumulative Loss | -161.81 | 180.67 | 180.67 | 189.46 | 187.96 | 184.66 | 180.06 | 165 | 0.00 |
| 17 | No. of Employees | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 2.83 |
| 18 | Total establishment cost | NA | NA | NA | NA | NA | NA | NA | 0 | 0.00 |

civ

*Annexure - 4*

## Performance of Continuously Loss Making PACS

Name of the Society : M.D.Spl. 22 B Meenatchipuram PACS
Date of Registration : 24.08.1967
Date of Commencement : 24.10.1967
Number of villages in the area of operation : 3 (B. Meenatchipuram, Pohalkalam, Durairajapuram Colony)

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 2188 | 2188 | 2218 | 2188 | 2188 | 2188 | 2188 | 2188 | 0.00 |
| 2 | Share Capital position | 6 | 6.11 | 7.99 | 9.01 | 9.56 | 9.87 | 9.95 | 10.27 | 6.95 |
| 3 | Borrowings | 247.68 | 283.7 | 285.93 | 336.61 | 347.48 | 110.95 | 154.63 | 183 | -3.71 |
| 4 | Deposits | 12.27 | 9.23 | 9.27 | 9.65 | 11.28 | 10.33 | 7.32 | 20.03 | 6.32 |
| 5 | ST loan outstanding | 51.49 | 52.15 | 18.24 | 27.68 | 33 | 41.58 | 45.12 | 32.26 | -5.68 |
| 6 | MT loan outstanding | 12.62 | 12.62 | 1.41 | 1.41 | 1.41 | 1.41 | 1.41 | 1.51 | -23.31 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 1.47 | 6.14 | 14.47 | 29.97 | 38 | 80.79 | 119.49 | 135.06 | 75.95 |
| 8 | Other loan outstanding | 2.65 | 1.91 | 0.48 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | -20.10 |
| 9 | Total loan outstanding (5+6+7+8) | 68.23 | 72.82 | 34.6 | 59.5 | 72.85 | 124.22 | 166.16 | 169.27 | 12.03 |
| 10 | Distribution of Fertilizer (Value) | 2.06 | 2.99 | 8.2 | 10.37 | 9.26 | 16.8 | 14.94 | 16.04 | 29.25 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 20.2 | 23.39 | 20 | 21.72 | 26.58 | 21.09 | 34.54 | 36.42 | 7.65 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 60% | 16% | 100% | 72% | 58% | 61% | 27% | 32% | -7.56 |
| 15 | Profit / Loss | -37.15 | -28.7 | 2.63 | -21.57 | -7.21 | 1.15 | 2.6 | 3 | 0.00 |
| 16 | Cumulative Loss | 243.02 | 271.72 | 269.09 | 290.66 | 297.88 | 296.73 | 294.13 | 312.12 | 3.18 |
| 17 | No. of Employees | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 11 | -2.07 |
| 18 | Total establishment cost | 5.84 | 3.84 | 9.62 | 10.44 | 8.79 | 9.15 | 9.72 | 7.05 | 2.38 |

cv

*Annexure - 5*

## Performance of Continuously Loss Making PACS

Name of the Society : A 737 Upparpatti PACS
Date of Registration : 15.03.1923
Date of Commencement : 19.06.1923
Number of villages in the area of operation : 3 (Upparpatti, Thiyagarapuram, Balagurunathapuram)

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 720 | 730 | 735 | 742 | 742 | 742 | 742 | 709 | -0.19 |
| 2 | Share Capital position | 3.7 | 3.59 | 4.55 | 5.34 | 5.65 | 6.69 | 7.03 | 11.73 | 15.51 |
| 3 | Borrowings | 131.02 | 140.85 | 117.52 | 120.51 | 129.66 | 140.17 | 149.78 | 81.67 | -5.74 |
| 4 | Deposits | 5.94 | 5.65 | 4.09 | 5.06 | 5.22 | 5.9 | 6.2 | 2 | -12.72 |
| 5 | ST loan outstanding | 21.85 | 41.7 | 2.27 | 13.99 | 27.26 | 69.31 | 65.8 | 64.12 | 14.40 |
| 6 | MT loan outstanding | 3.45 | 3.45 | 12.31 | 0 | 10.68 | 8.14 | 9.82 | 11.3 | 15.99 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 0 | 0 | 0 | 0 | 0 | 66.61 | 102.07 | 87.1 | 0.00 |
| 8 | Other loan outstanding | 0 | 38.63 | 0 | 0 | 0 | 0 | 7.96 | 12.16 | 0.00 |
| 9 | Total loan outstanding (5+6+7+8) | 25.3 | 83.78 | 14.58 | 13.99 | 37.94 | 144.06 | 185.65 | 174.68 | 27.32 |
| 10 | Distribution of Fertilizer (Value) | 0 | 0 | 4.5 | 8.19 | 8.54 | 7.99 | 8.26 | 8.42 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 8.95 | 9.2 | 8.19 | 8.47 | 8.99 | 9.15 | 9.49 | 9.52 | 0.77 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 0 | 0 | 0 | 19% | 21% | 42% | 29% | 70% | 0.00 |
| 15 | Profit / Loss | -30.1 | -41.79 | -57.21 | -62.4 | -62.4 | -66.7 | -70.21 | 2.21 | 0.00 |
| 16 | Cumulative Loss | 131.11 | 143.42 | 159.48 | 166.55 | 169.44 | 170.15 | 172.85 | 142.52 | 1.05 |
| 17 | No. of Employees | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 0.00 |
| 18 | Total establishment cost | 9.11 | 9.76 | 10.18 | 10.95 | 11.1 | 11.53 | 12.1 | 0.7 | -27.44 |

## Performance of Continuously Loss Making PACS

Name of the Society : MD Spl 114 Melmangalam BGCS
Date of Registration : 10.12.1969
Date of Commencement : 22.01.1970
Number of villages in the area of operation : 2

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 590 | 590 | 590 | 590 | 546 | 546 | 546 | 609 | 0.40 |
| 2 | Share Capital position | 1.52 | 1.54 | 1.56 | 1.58 | 2.07 | 4.05 | 4.38 | 4.86 | 15.64 |
| 3 | Borrowings | 62.51 | 69.42 | 64.56 | 72.35 | 79.61 | 91.9 | 122.71 | 124.71 | 9.02 |
| 4 | Deposits | 5.66 | 1.04 | 1.83 | 1.91 | 0.72 | 6.53 | 7.99 | 3.48 | -5.90 |
| 5 | ST loan outstanding | 2.33 | 3.71 | 1.53 | 1.64 | 5.67 | 16.81 | 26.21 | 29.33 | 37.24 |
| 6 | MT loan outstanding | 1.57 | 1.33 | 0 | 0 | NIL | NIL | NIL | 0 | -100.00 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 22.02 | 17.11 | 16.24 | 11.64 | 28.49 | 71.71 | 103.16 | 1.28 | -29.93 |
| 8 | Other loan outstanding | 11.69 | 10.49 | 4.01 | 9.64 | NIL | NIL | NIL | 0 | -100.00 |
| 9 | Total loan outstanding (5+6+7+8) | 37.61 | 32.64 | 21.78 | 22.92 | 34.16 | 88.52 | 129.27 | 30.61 | -2.54 |
| 10 | Distribution of Fertilizer (Value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 20% | 25% | 26% | 30% | 20% | 40% | 30% | 30% | 5.20 |
| 15 | Profit / Loss | 8.29 | 4.42 | 3.59 | 8.67 | -4.03 | 7.45 | 2.64 | 1.35 | -20.30 |
| 16 | Cumulative Loss | 44.26 | 48.68 | 52.27 | 60.94 | -60.94 | -53.49 | 50.85 | 48.16 | 1.06 |
| 17 | No. of Employees | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 5.20 |
| 18 | Total establishment cost | 3% | 4% | 4% | 5% | 5% | 3% | 2% | 2% | -4.94 |

## Performance of Continuously Loss Making PACS

Name of the Society : MD Spl 113 Jeyamangalam BGCS
Date of Registration : 06.12.1969
Date of Commencement : 12.12.1969
Number of villages in the area of operation : 5

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 1057 | 1057 | 1057 | 1058 | 1058 | 1058 | 1058 | 1058 | 0.01 |
| 2 | Share Capital position | 1.39 | 1.39 | 1.39 | 1.67 | 1.67 | 1.67 | 1.67 | 1.67 | 2.32 |
| 3 | Borrowings | 4.97 | 25.31 | 21.34 | 14.18 | 13.91 | 27.31 | 68.82 | 72.14 | 39.71 |
| 4 | Deposits | 0.03 | 0.02 | 0.02 | 0.55 | 0.61 | 0.64 | 0.23 | 0.28 | 32.21 |
| 5 | ST loan outstanding | 0.84 | 19.87 | 18.89 | 2.84 | 2.31 | 2.39 | 3.16 | 3.58 | 19.87 |
| 6 | MT loan outstanding | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 3.9 | 4.18 | 5.24 | 6.15 | 6.49 | 17.92 | 62.73 | 76.54 | 45.08 |
| 8 | Other loan outstanding | 0 | 0 | 4.17 | 4.17 | 4.17 | 4.17 | 0.64 | 1.12 | 0.00 |
| 9 | Total loan outstanding (5+6+7+8) | 4.74 | 24.05 | 20.3 | 13.16 | 12.97 | 24.48 | 66.53 | 81.24 | 42.64 |
| 10 | Distribution of Fertilizer (Value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 35% | 37% | 81% | 20% | 27% | 24% | 30% | 45% | 3.19 |
| 15 | Profit / Loss | 0 | 0 | 8.54 | -1.95 | -0.62 | -0.05 | -1.33 | 0.42 | 0.00 |
| 16 | Cumulative Loss | 0 | -31.54 | -22.93 | 24.95 | 25.57 | -25.62 | -26.95 | -18.57 | 0.00 |
| 17 | No. of Employees | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.00 |
| 18 | Total establishment cost | 2 | 3 | 2 | 3 | 3 | 2 | 1.5 | 1.3 | -5.24 |

## Performance of Continuously Loss Making PACS

Name of the Society : MD Spl 81, Mullaiampatti PACS
Date of Registration : 28.12.1968
Date of Commencement : 19.01.1969
Number of villages in the area of operation : 7

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005 - 06 | 2006 - 07 | 2007 -08 | 2008-09 | 2009 -10 | 2010 -11 | 2011 -12 | A G RATE |
| 1 | No. of Members | 1116 | 1129 | 1129 | 1129 | 1129 | 1129 | 1129 | 1116 | 0.00 |
| 2 | Share Capital position | 3.05 | 3.13 | 5.9 | 7.8 | 7.87 | 9.03 | 9.61 | 3.05 | 0.00 |
| 3 | Borrowings | 44.98 | 54.91 | 52.15 | 57.28 | 71.92 | 83.05 | 151.99 | 44.98 | 0.00 |
| 4 | Deposits | 5.28 | 4.79 | 6.12 | 4.27 | 5.8 | 6.18 | 26.95 | 10.21 | 8.59 |
| 5 | ST loan outstanding | 13.91 | 14.16 | 9.64 | 11.48 | 9.07 | 11.72 | 18.03 | 3.86 | -14.81 |
| 6 | MT loan outstanding | 6.36 | 10.52 | 1.51 | 1.47 | 0.98 | 0.98 | 0.98 | 6.36 | 0.00 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 0.27 | 8.8 | 20.65 | 27.68 | 42.6 | 87.73 | 162.95 | 0.27 | 0.00 |
| 8 | Other loan outstanding | 1.38 | 2.7 | 11.2 | 6.63 | 10.81 | 6.33 | 13.92 | 11.43 | 30.25 |
| 9 | Total loan outstanding (5+6+7+8) | 21.92 | 36.18 | 43 | 47.26 | 63.46 | 106.76 | 195.88 | 21.92 | 0.00 |
| 10 | Distribution of Fertilizer (Value) | 0 | 0 | 0 | 0.63 | 5.09 | 2.33 | 4.66 | 4.68 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 24.98 | 31.14 | 25.48 | 23.63 | 30.84 | 36.16 | 46.06 | 46.66 | 8.12 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 50% | 59% | 65% | 80.00% | 85% | 90% | 97.00% | 97 | 93.19 |
| 15 | Profit / Loss | -4.47 | -0.13 | 22.42 | 1.45 | 1.88 | 0.55 | 0.74 | 4.47 | 0.00 |
| 16 | Cumulative Loss | 54.97 | 55.1 | 32.68 | 31.23 | 29.34 | 28.79 | 28.05 | 54.97 | 0.00 |
| 17 | No. of Employees | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 2.31 |
| 18 | Total establishment cost | 2.68 | 2.76 | 2.94 | 3.37 | 4.62 | 5.07 | 6.12 | 2.35 | -1.63 |

## Performance of Continuously Profit Making PACS

Name of the Society : DD 270 Vadapudupatty PACS
Date of Registration : 29.09.1960
Date of Commencement : 10.10.1960
Number of villages in the area of operation : 8

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 2679 | 2682 | 2682 | 2682 | 2682 | 2682 | 2682 | 2681 | 0.01 |
| 2 | Share Capital position | 5.2 | 5.38 | 6.1 | 6.59 | 5.98 | 6.62 | 8.08 | 3.9 | -3.53 |
| 3 | Borrowings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 334.53 | 0.00 |
| 4 | Deposits | 77.23 | 77.72 | 114.06 | 148.06 | 156.93 | 157.27 | 181.74 | 206 | 13.05 |
| 5 | ST loan outstanding | 8.74 | 8.28 | 8.42 | 9.36 | 14.47 | 30.79 | 53.57 | 78.14 | 31.50 |
| 6 | MT loan outstanding | 9.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | -38.36 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 76.1 | 101.76 | 155.63 | 241.9 | 257.07 | 314.47 | 184.58 | 239.5 | 15.41 |
| 8 | Other loan outstanding | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26.69 | 0.00 |
| 9 | Total loan outstanding (5+6+7+8) | 94.44 | 110.04 | 164.05 | 251.26 | 271.54 | 345.26 | 238.15 | 344.53 | 17.56 |
| 10 | Distribution of Fertilizer (Value) | 5.59 | 12.77 | 23.01 | 23.06 | 46.67 | 34.71 | 38.87 | 39.14 | 27.54 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 25.06 | 24.65 | 20.71 | 19.21 | 24.47 | 32.65 | 21.25 | 24.18 | -0.45 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 98% | 0.00 |
| 14 | Recovery % (at PACS level from members) | 92% | 90% | 96% | 94% | 94% | 99% | 98% | 4.93 | 23.39 |
| 15 | Profit / Loss | 3.04 | 3.13 | 7 | 3.1 | 8.07 | 9.26 | 11.42 | 0 | -100.00 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0.00 |
| 17 | No. of Employees | 7 | 7 | 7 | 7 | 8 | 8 | 7 | 7.89 | 1.51 |
| 18 | Total establishment cost | 5.68 | 6.71 | 6.82 | 8.57 | 11.87 | 10.86 | 15.44 | 16.24 | 14.03 |

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## Performance of Continuously Profit Making PACS

Name of the Society : A 915 Govindanagaram PACS
Date of Registration :
Date of Commencement :
Number of villages in the area of operation :

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 828 | 450 | 448 | 335 | 325 | 325 | 307 | 304 | -11.77 |
| 2 | Share Capital position | 12.69 | 13.28 | 12.93 | 10.71 | 10.38 | 10.25 | 10.55 | 10.92 | -1.86 |
| 3 | Borrowings | 59.54 | 64.28 | 95.93 | 85.44 | 75.16 | 54.17 | 81.5 | 76.48 | 3.18 |
| 4 | Deposits | 179.64 | 158.26 | 156.08 | 177.77 | 219.7 | 276.52 | 279.34 | 308.94 | 7.01 |
| 5 | ST loan outstanding | 37.65 | 34.18 | 29.43 | 28.43 | 24.57 | 24.86 | 25.28 | 11.76 | -13.54 |
| 6 | MT loan outstanding | 37.15 | 36.37 | 26.04 | 11.63 | 7.47 | 5.76 | 3.25 | 2.34 | -29.22 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 100.14 | 127.99 | 180.66 | 214.44 | 251.49 | 288.27 | 309.1 | 330.07 | 16.08 |
| 8 | Other loan outstanding | 39.26 | 20.6 | 19.31 | 15.25 | 19.88 | 24.39 | 20.49 | 22.44 | -6.75 |
| 9 | Total loan outstanding (5+6+7+8) | 214.2 | 219.14 | 255.46 | 269.75 | 303.41 | 343.28 | 358.12 | 366.54 | 6.95 |
| 10 | Distribution of Fertilizer (Value) | 5.1 | 7.88 | 10.27 | 13.33 | 24.17 | 9.47 | 9.44 | 9.65 | 8.30 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 90% | 94% | 98% | 95% | 100% | 100% | 100% | 100% | 1.33 |
| 15 | Profit / Loss | 3.3 | 2.43 | 3.01 | 5.85 | 7.59 | 10.39 | 5 | 6 | 7.76 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0.00 |
| 18 | Total establishment cost | 7.83 | 8.58 | 10.22 | 10.32 | 11.12 | 12.47 | 18.06 | 18.4 | 11.27 |

## Performance of Continuously Profit Making PACS

Name of the Society : A 1807 Silamalai PACS
Date of Registration : 31.10.1956
Date of Commencement : 21.11.1956
Number of villages in the area of operation : 3

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 2889 | 2889 | 2889 | 2889 | 2889 | 2889 | 2889 | 2889 | 0.00 |
| 2 | Share Capital position | 7.17 | 7.28 | 8.04 | 7.59 | 8.19 | 9.2 | 10.15 | 11.12 | 5.64 |
| 3 | Borrowings | 105.65 | 120.18 | 96.82 | 142.83 | 181.38 | 72.79 | 104.72 | 104.65 | -0.12 |
| 4 | Deposits | 52.65 | 50.42 | 48.17 | 42.77 | 39.42 | 45.83 | 32.53 | 30.74 | -6.51 |
| 5 | ST loan outstanding | 6.57 | 10.44 | 6.88 | 18.95 | 24.81 | 32.24 | 35.55 | 34.19 | 22.90 |
| 6 | MT loan outstanding | 16.3 | 15.63 | 1.01 | 0.97 | 0.93 | 0.93 | 0.82 | 0.74 | -32.06 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 1.98 | 2.61 | 0.27 | 22.91 | 50.31 | 74.16 | 109.72 | 112.65 | 65.72 |
| 8 | Other loan outstanding | 21.76 | 17.04 | 0.6 | 0.6 | 0.71 | 0.71 | 0.06 | 0.05 | -53.21 |
| 9 | Total loan outstanding (5+6+7+8) | 46.61 | 48.72 | 8.76 | 42.43 | 76.76 | 108.04 | 146.15 | 147.58 | 15.50 |
| 10 | Distribution of Fertilizer (Value) | 0.06 | 0.06 | 2.31 | 4.97 | 12.13 | 13.49 | 15.58 | 16.42 | 101.68 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0.25 | 0.25 | 0.25 | 0.00 |
| 12 | Consumer goods | 21.76 | 26.46 | 22.24 | 19.91 | 27.01 | 31.32 | 41.42 | 41.54 | 8.42 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0.7 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 71% | 33% | 37% | 70% | 35% | 77% | 80% | 86% | 2.42 |
| 15 | Profit / Loss | -38.92 | -18.11 | 10.22 | -21.24 | 28.75 | -28.05 | 1.2 | 2% | 0.00 |
| 16 | Cumulative Loss | 157.22 | 175.33 | 165.51 | 185.54 | 193.05 | 198.05 | 198.25 | 190.12 | 2.40 |
| 17 | No. of Employees | 12 | 11 | 11 | 10 | 10 | 10 | 8 | 8 | -4.94 |
| 18 | Total establishment cost | 4.91 | 2.37 | 6.7 | 8 | 7.24 | 10.29 | 17.65 | 15.42 | 15.38 |

## Performance of Continuously Profit Making PACS

Name of the Society : MD Spl 11 Bodi BGCS
Date of Registration : 26.05.1964
Date of Commencement : 24.06.1964
Number of villages in the area of operation : 6

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 747 | 747 | 747 | 747 | 747 | 747 | 747 | 747 | 0.00 |
| 2 | Share Capital position | 4.3 | 4.32 | 4.32 | 4.9 | 4.9 | 4.95 | 7.05 | 6.91 | 6.11 |
| 3 | Borrowings | 60 | 62.1 | 65 | 75.1 | 78.15 | 86.4 | 95.8 | 85.05 | 4.46 |
| 4 | Deposits | 73.79 | 119 | 163.98 | 212.78 | 275.08 | 152.1 | 87.34 | 88.83 | 2.35 |
| 5 | ST loan outstanding | 0.98 | 7.12 | 2.18 | 2.69 | 0.98 | 2.8 | 2.8 | 3.05 | 15.25 |
| 6 | MT loan outstanding | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 171.61 | 222.56 | 309.13 | 336.01 | 198.1 | 210.7 | 232.15 | 290 | 6.78 |
| 8 | Other loan outstanding | 1.13 | 32.72 | 24.15 | 33.51 | 27.15 | 38 | 54.7 | 32.15 | 51.97 |
| 9 | Total loan outstanding (5+6+7+8) | 173.72 | 262.4 | 335.46 | 372.21 | 226.23 | 251.5 | 289.65 | 325.15 | 8.15 |
| 10 | Distribution of Fertilizer (Value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 71% | 77% | 79% | 81% | 80% | 70% | 68% | 72% | 0.17 |
| 15 | Profit / Loss | 3.48 | 8.17 | 21.25 | 17.91 | 18.62 | 11.26 | 12.55 | 9.15 | 12.84 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0.00 |
| 18 | Total establishment cost | 1.7 | 1.7 | 1.65 | 2.15 | 2.18 | 2.3 | 2.68 | 2.96 | 7.18 |

## Performance of Continuously Profit Making PACS

Name of the Society : A 1616 Periyasinthalaichery PACS
Date of Registration : 30.08.1942
Date of Commencement : 19.10.1942
Number of villages in the area of operation : 2

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 0.009 | 0.009 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 1.33 |
| 2 | Share Capital position | 3.09 | 3.31 | 3.72 | 3.76 | 4.17 | 4.43 | 4.36 | 7.65 | 12.00 |
| 3 | Borrowings | 28.15 | 23.69 | 33.58 | 36.05 | 38.61 | 50.56 | 75.7 | 64.05 | 10.82 |
| 4 | Deposits | 38.55 | 32.88 | 18.2 | 17.6 | 36.52 | 45.31 | 57.52 | 78.16 | 9.24 |
| 5 | ST loan outstanding | 4.97 | 5.13 | 7.3 | 7.5 | 8.8 | 12.6 | 8.46 | 11.5 | 11.06 |
| 6 | MT loan outstanding | 4.38 | 5.08 | 0 | 0 | 0.22 | 0.19 | 0.19 | 0.19 | -32.44 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 48.98 | 47.42 | 38.38 | 46.48 | 73.65 | 121.34 | 170 | 167.73 | 16.63 |
| 8 | Other loan outstanding | 6.31 | 5.95 | 3.76 | 1.77 | 1.83 | 1.06 | 1.7 | 14.36 | 10.83 |
| 9 | Total loan outstanding (5+6+7+8) | 64.64 | 63.58 | 49.44 | 55.75 | 84.5 | 135.19 | 180.35 | 193.78 | 14.71 |
| 10 | Distribution of Fertilizer (Value) | 0.8 | 0 | 1.62 | 0.36 | 4.44 | 3.24 | 6.22 | 8.16 | 33.68 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 17.75 | 20.24 | 17.14 | 17.72 | 19.6 | 21.62 | 29.71 | 32.4 | 7.81 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 56% | 60% | 65% | 56% | 64% | 65% | 67% | 72% | 3.19 |
| 15 | Profit / Loss | 2.72 | 3.71 | 5.04 | 2.55 | 1.57 | 1.85 | 2.05 | 6.5 | 11.50 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3.66 |
| 18 | Total establishment cost | 2.35 | 1.98 | 2.53 | 3.83 | 4.12 | 5 | 5.11 | 5.4 | 10.96 |

## Performance of Continuously Profit Making PACS

Name of the Society : A 1757 Kamatchipuram PACS
Date of Registration : 06.04.1946
Date of Commencement : 16.04.1946
Number of villages in the area of operation : 6

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 1553 | 1553 | 1553 | 1553 | 1553 | 1359 | 1359 | 1359 | -1.65 |
| 2 | Share Capital position | 0 | 0 | 0 | 0 | 0 | 0 | 14.69 | 11.33 | 0.00 |
| 3 | Borrowings | 39.23 | 39.27 | 30.77 | 82.7 | 102.62 | 122.54 | 159.25 | 179.96 | 20.97 |
| 4 | Deposits | 77.99 | 70.44 | 62.23 | 57.94 | 48.66 | 57.86 | 71.09 | 128.92 | 6.48 |
| 5 | ST loan outstanding | 19.86 | 20.38 | 13.78 | 18.35 | 18.35 | 37.33 | 53.61 | 59.4 | 14.68 |
| 6 | MT loan outstanding | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 104.3 | 96.75 | 109.93 | 172.74 | 172.74 | 175.51 | 223.5 | 292.72 | 13.77 |
| 8 | Other loan outstanding | 11.73 | 8.55 | 8.29 | 3.37 | 3.38 | 0.07 | 0.15 | 4.91 | -10.31 |
| 9 | Total loan outstanding (5+6+7+8) | 173.3 | 128.13 | 132 | 194.46 | 194.47 | 212.91 | 277.26 | 357.03 | 9.46 |
| 10 | Distribution of Fertilizer (Value) | 4.81 | 9.26 | 8.2 | 8.86 | 26.44 | 18.64 | 19.03 | 20.14 | 19.60 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 18.59 | 22.49 | 19.16 | 20.32 | 24.04 | 27.31 | 35.03 | 38.17 | 9.41 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0.28 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 0 | 0 | 0 | 0 | 0 | 0 | 86% | 94% | 0.00 |
| 15 | Profit / Loss | -0.97 | -0.14 | 9.98 | 1.94 | 1.54 | 7.06 | 5.06 | 23 | 0.00 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 8 | 1.68 |
| 18 | Total establishment cost | NA | NA | NA | NA | NA | NA | 8.25 | 5 | 0.00 |

## Performance of Continuously Profit Making PACS

Name of the Society : MD Spl 108 Cumbum PACS
Date of Registration : 24.06.1969
Date of Commencement : 23.10.1969
Number of villages in the area of operation : 1 (Cumbum)

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 3028 | 3062 | 3043 | 3039 | 3000 | 2991 | 2975 | 2936 | -0.38 |
| 2 | Share Capital position | 26.15 | 28.22 | 34.46 | 37.88 | 33.92 | 37.09 | 36.06 | 33.18 | 3.02 |
| 3 | Borrowings | 130.06 | 177.92 | 109.69 | 114.4 | 170.66 | 190.21 | 188.62 | 238.37 | 7.87 |
| 4 | Deposits | 233.71 | 192.22 | 221.7 | 339.43 | 463.71 | 561.94 | 700.89 | 656.91 | 13.79 |
| 5 | ST loan outstanding | 80.97 | 116.68 | 104.85 | 148.5 | 153.83 | 174.4 | 187.57 | 196.5 | 11.72 |
| 6 | MT loan outstanding | 62.15 | 60.41 | 75.85 | 55.69 | 15.05 | 9.44 | 2.54 | 11.12 | -19.35 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 156.3 | 177.97 | 232.55 | 318.83 | 323.37 | 368.97 | 476.19 | 700.19 | 20.62 |
| 8 | Other loan outstanding | 2.15 | 4.61 | 1.4 | 1.8 | 1.9 | 1.95 | 2.15 | 2.56 | 2.21 |
| 9 | Total loan outstanding (5+6+7+8) | 301.57 | 359.67 | 414.65 | 524.82 | 499.15 | 554.78 | 668.5 | 910.37 | 14.81 |
| 10 | Distribution of Fertilizer (Value) | 8.69 | 21.38 | 38.14 | 22.82 | 39.52 | 43.81 | 44.6 | 45.28 | 22.92 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 53.39 | 71.7 | 58.55 | 56.62 | 57.39 | 75.71 | 79.15 | 82.42 | 5.58 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 91% | 91% | 95% | 96.30% | 97% | 100% | 100.00% | 100% | 1.13 |
| 15 | Profit / Loss | 20.8 | 29.26 | 16.06 | 56.36 | 14.92 | 21.45 | 25.3 | 44 | 9.82 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 21 | 20 | 19 | 19 | 19 | 17 | 17 | 16 | -3.34 |
| 18 | Total establishment cost | 13.86 | 14.81 | 16.75 | 16.87 | 21.29 | 2.29 | 23.19 | 27.46 | 8.92 |

## Performance of Continuously Profit Making PACS

Name of the Society : MD Spl 181 Uthamapuram PACS
Date of Registration : 27.02.1971
Date of Commencement : 12.04.1971
Number of villages in the area of operation : 2

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 1902 | 1893 | 1889 | 1887 | 1881 | 1880 | 1880 | 1952 | 0.32 |
| 2 | Share Capital position | 10.82 | 11.39 | 13.3 | 13.47 | 13.56 | 12.57 | 12.87 | 14.61 | 3.83 |
| 3 | Borrowings | 72.17 | 88.98 | 160.07 | 139.6 | 86.38 | 89.44 | 88.33 | 96.5 | 3.70 |
| 4 | Deposits | 59.65 | 62.61 | 72.83 | 70.22 | 79.46 | 86.87 | 192.07 | 142.25 | 11.48 |
| 5 | ST loan outstanding | 37.96 | 29.56 | 26.81 | 36.18 | 42.79 | 65.46 | 88.67 | 96 | 12.30 |
| 6 | MT loan outstanding | 37.54 | 55.65 | 4.04 | 4.98 | 4.11 | 1.96 | 6.27 | 5.75 | -20.91 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 84.6 | 110.49 | 159.89 | 177.88 | 148.85 | 160.61 | 196.53 | 270.5 | 15.64 |
| 8 | Other loan outstanding | 2.47 | 4.83 | 5.32 | 25.81 | 6.13 | 7.16 | 1.43 | 0.66 | -15.21 |
| 9 | Total loan outstanding (5+6+7+8) | 162.57 | 200.53 | 196.06 | 221.97 | 201.88 | 235.19 | 292.9 | 372.91 | 10.94 |
| 10 | Distribution of Fertilizer (Value) | 2.61 | 3.19 | 7.74 | 9.46 | 18.81 | 12.81 | 18.07 | 22.05 | 30.57 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 12 | Consumer goods | 46.53 | 71 | 53.78 | 48.5 | 57.69 | 75.8 | 83.62 | 94.52 | 9.26 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 84% | 90% | 97% | 92% | 90% | 100% | 93% | 96% | 1.74 |
| 15 | Profit / Loss | -2.88 | 0.12 | 28.99 | 8.7 | 10.51 | 10.7 | 9.46 | 11 | 0.00 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 8 | 8 | 8 | 9 | 9 | 9 | 12 | 8 | 0.00 |
| 18 | Total establishment cost | 9.34 | 7.6 | 7.89 | 8.63 | 11.97 | 10.3 | 12.86 | 14.28 | 5.45 |

## Performance of Continuously Profit Making PACS

Name of the Society :A 425 Kamayagoundanpatty PACS
Date of Registration : 04.09.1919
Date of Commencement : 09.09.1919
Number of villages in the area of operation :

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 4788 | 4803 | 4787 | 4783 | 4780 | 4775 | 4762 | 4755 | -0.09 |
| 2 | Share Capital position | 18.56 | 20.22 | 27.24 | 27.83 | 29.71 | 31.54 | 30.8 | 30.7 | 6.49 |
| 3 | Borrowings | 24.95 | 27.22 | 96.18 | 76.29 | 84.29 | 197.49 | 246.33 | 181.46 | 28.15 |
| 4 | Deposits | 288.85 | 345.52 | 445.3 | 503.66 | 623.46 | 642.43 | 702.57 | 873.85 | 14.84 |
| 5 | ST loan outstanding | 42.87 | 72.88 | 70.18 | 91.48 | 125.72 | 147.77 | 190.33 | 183.87 | 19.96 |
| 6 | MT loan outstanding | 39.72 | 50.62 | 27.91 | 19.4 | 37.95 | 47.57 | 30.65 | 16.01 | -10.74 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 214.37 | 226.24 | 308.31 | 329.21 | 404.86 | 535.48 | 745.73 | 925.71 | 20.06 |
| 8 | Other loan outstanding | 15.04 | 10.45 | 9.9 | 19.98 | 24.42 | 25.7 | 15.75 | 17.42 | 1.85 |
| 9 | Total loan outstanding (5+6+7+8) | 312 | 360.39 | 416.3 | 460.07 | 592.95 | 756.52 | 982.46 | 960.14 | 15.09 |
| 10 | Distribution of Fertilizer (Value) | 8.68 | 12.61 | 16.14 | 23.86 | 51.2 | 40.82 | 51.02 | 56.04 | 26.25 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0.54 | 0.22 | 0.43 | 0.3 | 0.2 | 0.00 |
| 12 | Consumer goods | 83.42 | 103.17 | 75.83 | 71.9 | 78.63 | 100.78 | 129.39 | 142.37 | 6.91 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 96% | 94% | 97% | 95.00% | 94% | 98% | 99.00% | 99% | 0.39 |
| 15 | Profit / Loss | 18.5 | 16.55 | 24.24 | 28.28 | 20.09 | 33.73 | 37.61 | 38.18 | 9.48 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 19 | 18 | 18 | 17 | 14 | 15 | 13 | 11 | -6.60 |
| 18 | Total establishment cost | 17.05 | 18.06 | 17.38 | 20.38 | 27.82 | 26.65 | 35.04 | 48.25 | 13.89 |

## Performance of Continuously Profit Making PACS

Name of the Society : A 1187 C. Pudupatti PACS
Date of Registration : 29.06.1930
Date of Commencement : 30.06.1930
Number of villages in the area of operation : 1

| Sl. No. | Description | Achievement As on 31st March (Rupees in Lakhs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2004-05 (Base Year) | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | A G RATE |
| 1 | No. of Members | 1441 | 1430 | 1463 | 1449 | 1441 | 1430 | 1429 | 1428 | -0.11 |
| 2 | Share Capital position | 12.78 | 12.9 | 19.87 | 20.6 | 20.87 | 21.74 | 22.66 | 19.89 | 5.68 |
| 3 | Borrowings | 63.89 | 61.81 | 36.91 | 52.82 | 43.18 | 76.83 | 102.68 | 83.85 | 3.46 |
| 4 | Deposits | 256.9 | 268.98 | 325.44 | 365.22 | 536.42 | 553.91 | 485.09 | 483.86 | 8.24 |
| 5 | ST loan outstanding | 39.02 | 45.27 | 35.54 | 52.47 | 61.18 | 81.96 | 97.02 | 40.77 | 0.55 |
| 6 | MT loan outstanding | 52.11 | 44.76 | 21.61 | 12.8 | 17.58 | 26.95 | 28.02 | 25.28 | -8.65 |
| 7 | Jewel loan outstanding (Both agri and general JL) | 102.9 | 121.01 | 178.15 | 212.34 | 223.32 | 240.58 | 266.58 | 299.31 | 14.28 |
| 8 | Other loan outstanding | 5.1 | 14.83 | 17.38 | 20.04 | 10.26 | 13.09 | 10.68 | 24.61 | 21.74 |
| 9 | Total loan outstanding (5+6+7+8) | 199.13 | 225.87 | 252.68 | 297.67 | 312.34 | 362.58 | 402.3 | 389.97 | 8.76 |
| 10 | Distribution of Fertilizer (Value) | 8.69 | 13.95 | 19.1 | 17.48 | 34.67 | 29.42 | 34.94 | 35.28 | 19.14 |
| 11 | Supply of other inputs (Including Agricultural implements in value) | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 0.00 |
| 12 | Consumer goods | 32.84 | 41.82 | 33.15 | 32.23 | 36.78 | 47.46 | 58.37 | 59.37 | 7.68 |
| 13 | Agricultural Produce marketed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 14 | Recovery % (at PACS level from members) | 92% | 94% | 92% | 83% | 96% | 97% | 95% | 96% | 0.49 |
| 15 | Profit / Loss | 3 | 5.62 | 9.67 | 3.01 | 2.12 | 11.84 | 16.3 | 18.56 | 25.58 |
| 16 | Cumulative Loss | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 17 | No. of Employees | 13 | 13 | 13 | 13 | 12 | 9 | 8 | 8 | -5.89 |
| 18 | Total establishment cost | 13.17 | 13.99 | 15.65 | 18.15 | 21.58 | 18.86 | 17.84 | 19.25 | 4.86 |

## I. Data Sheet for ICDP Office
## Impact of ICDP in Theni District

1) Date of Project Launched :
2) Date of Project Completed :
3) No of Cooperatives covered :
4) Cooperative Societies covered under ICDP in Theni District

| S. No | Types of Societies | No. of Societies |
|---|---|---|
| | | |
| | | |

5) Pattern of funding under ICDP

| S. No | Activity | From NCDC to State Govt. | From State Govt. to Cooperatives |
|---|---|---|---|
| | | | |
| | | | |

6) Members of DLCC

| S. No | Members | Position |
|---|---|---|
| | | |
| | | |

7) Members of PIAC

| S. No | Members | Position |
|---|---|---|
| | | |
| | | |

8) List of General Managers served during the Project period

| S. No | General Manager | Period of Service |
|---|---|---|
| | | |
| | | |

9) Date of PIAC held

| Meeting | Date of Meeting |
|---|---|
| | |
| | |

10) Project outlay

| S. No | Sector | Outlay recommended by the DPR | Outlay approved by the NCDC | Actual Amount spent |
|---|---|---|---|---|
| | | | | |
| | | | | |

11) Project Period

| Project Periods | | Government Orders |
|---|---|---|
| Year | Date | |
| | | |
| | | |

12)Rate of interest

| Date | Before the due date | Within 3 months from due date | After 3 months of due date |
|---|---|---|---|
| | Effective Rate of Interest | Normal Rate of Interest (+ 1%) | Penal Rate of Interest (+2.5) |
| | | | |
| | | | |

13)Sector – Wise Deviation Proposals Approved

| S. No | Sector | Total outlay for five years mentioned in G.O | | Programme Dropped | | Additional Programme included due to Deviation approved | | Total Programme approved | | Funds Released During the month | | Funds Released up to the Month | | Balance | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin | Phy | Fin | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

14) Sector wise Employees deputed for Training

| S. No | Sector | No. of Trainees | No. of Training Programmes |
|---|---|---|---|
| | | | |
| | | | |

15)Expenditure on Manpower Development and Training

| Details | Outlay For Five years (Rs. in Lakhs) | Utilized | % of Utilization |
|---|---|---|---|
| | | | |
| | | | |

16)Training and incentives distributed

| S. No | Cadre of Personnel | Nature of Training Imparted | No. of Persons Covered | Amount Expended | Total amount |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

17) ICDP and PDS

| S. No | No. of Programmes organized | Budget outlay |
|---|---|---|
| | | |
| | | |
| | | |

18)Disbursement of Incentives to PACS

| S. No | Name of the PACS & PCS | 2006-2007 | | 2007-2008 | | 2008-2009 | | 2009-2010 | | 2010-2011 | | Total No. of Employees | Total Incentive Released |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of Employees | Incentive released | No. of Employees | Incentive released | No. of Employees | Incentive released | No. of Employees | Incentive released | No. of Employees | Incentive released | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Total Budget**

| Cooperative Sector Name | Year Wise Phasing | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I Year | 2 Year | 3 Year | 4 Year | 5 Year | I Year | 2 Year | 3 Year | 4 Year | 5 Year |
| | Target (Rs. in Lakhs) | | | | | Achievement (Rs. in Lakhs) | | | | |
| PACS | | | | | | | | | | |
| CMS | | | | | | | | | | |
| PCARDBS | | | | | | | | | | |
| Primary Milk Cooperatives | | | | | | | | | | |
| Primary Sheep breeding Cooperatives | | | | | | | | | | |
| Industrial Cooperatives | | | | | | | | | | |
| Handloom Cooperative Societies | | | | | | | | | | |
| Fisheries Cooperatives | | | | | | | | | | |
| Primary Consumer Stores | | | | | | | | | | |
| College and School Cooperatives | | | | | | | | | | |
| Weaker Section Cooperatives | | | | | | | | | | |
| DCCB | | | | | | | | | | |
| Manpower Development & Training | | | | | | | | | | |
| **Total** | | | | | | | | | | |

## II. Data Sheet for Cooperative Societies in Theni District

1) Block wise presence of PACS in Theni District

| S. No | Name of the Block | Total PACS |
|---|---|---|
| | | |
| | | |
| | | |

2) List of PACS which were Registered before Independence

| S. No | Name of the PACS | Year of Registration | Year of starting |
|---|---|---|---|
| | | | |
| | | | |

3) Block wise Position of Members of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |

4) Block wise Share Capital Position of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

5) Block Wise Position of Borrowings of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

6) Block wise Position of Deposits of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |

7) Block wise position of Loan Outstanding of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

8) Block wise position of Jewel Loan of PACS

| S. No | Blocks | No of PACS | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |

9) Viability Status of PACS

| Viability Status | As on 31.3.2002 (As per DPR) | As on 31.3.2010 | As on 31.3.2012 |
|---|---|---|---|
| Viable | | | |
| Potentially Viable | | | |
| Unviable | | | |
| Total | | | |

10) Budget Outlay for PACS

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

11) Construction of New / Additional Godown

| S. No | Name of the PACS | Assistance Sanctioned by PIT / PIA | | | Date of Completion | Capacity of Godown (in MT) | Floor area (in Sq. Mtrs) | Height (in Mtrs.) | Cost Incurred |
|---|---|---|---|---|---|---|---|---|---|
| | | Date | Loan | Share | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

12) Repairs / Renovation of Godown

| S. No | Name of the PACS | Assistance Sanctioned by PIT / PIA | | | Date of Completion | Capacity of Godown (in MT) | Floor area (in Sq. Mtrs) | Height (in Mtrs.) | Cost Incurred |
|---|---|---|---|---|---|---|---|---|---|
| | | Date | Loan | Share | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

13)Dormant PACS Revived

| S. No | Name of the Society | Type of Assistance Provided | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Alarm Bell | Generator | JLWM | NCM | Repair to Godown | Repair to Office Building | Margin Money | Assistance to Weaker Sections | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

14)Performance in Loan Issued in Revived PACS

| S. No | Name of the PACS | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

15)Income Generated in Godowns per Society

| Godown | Capacity | Income | | | | |
|---|---|---|---|---|---|---|
| | | 2006-07 | 2007 - 08 | 2008-09 | 2009 -10 | 2010 -11 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

16)SHG wise Loan Outstanding

| S. No | Name of the SHG | Loan Amount in Rupees (As on 31.3.2011) Loan Outstanding |
|---|---|---|
| | | |
| | | |

17)Business Performance of MDCC Bank (Theni District)

| S. No | Description | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |

18)Budget Outlay for DCC Bank

| S. No | Sub Projects | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |

19)Business Profile of Theni Cooperative Marketing Society

| S. No | Description | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

20)Business Profile of Uthamapalayam Cooperative Marketing Society

| S. No | Description | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

21)Budget Outlay for Primary Agricultural Cooperative Marketing Societies

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

22)Business Profile of Cooperative Consumer Store in Theni District

| Name of the Society | Year | No. of Members | Working Capital | Sales Turnover | | | Profit | Establishment cost |
|---|---|---|---|---|---|---|---|---|
| | | | | a) Controlled | b) Non – Controlled | c) Total (a +b) | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

23)Budget Outlay for Primary Consumer Cooperative Stores in Theni District

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

24) Budget Outlay for Primary Milk Producers Cooperative Societies in Theni District

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

25) Budget Outlay for Weavers Cooperative Societies in Theni District

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

26) Budget Outlay for Weaker Section Cooperative Societies in Theni District

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

27) Budget Outlay for Industrial Cooperative Societies in Theni District

| S. No | Activity | Proposed in the DPR | | Total outlay for five years mentioned in G.O | | Actual Expenditure | |
|---|---|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin | Phy | Fin |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

28) Budget Outlay for Primary Sheep Breeding Cooperative Societies

| S. No | Activity | Total outlay for five years mentioned in G.O | | Funds Released | |
|---|---|---|---|---|---|
| | | Phy | Fin | Phy | Fin |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |