INTRODUCTION

Pulses occupy an important place in the agricultural economy of India. They are grown all the year round and they are the rich source of protein to the human beings and nitrogen to the soil. Pulses like arhar, urdbean, moongbean, mothbean, kulthi (Horse gram), and cowpea are grown in the kharif season while Bengal gram, fieldpeas, lentil and khesari (lathyrus) are grown in the rabi season. Moongbean and urdbean are also grown in the spring/summer season after harvesting sugarcane, wheat, potato and mustard in the northern region and in the south and south eastern regions during rabi season following rice crop.

Among the major pulse crops arhar (Pigeon pea) moong and gram occupy a prominent place. Pulses are grown in almost all the states in India but major producers are Uttar Pradesh, Madhya Pradesh, Orissa, Maharashtra and Rajasthan. Being an item of mass consumption, even at current level of consumption, demand for pulses exceeds it production. Paradoxically, India is the largest producer of pulses yet its per capita availability in recent years has declined.

At present, pulses are grown over an area of 23 million hectare which constitute 18% of area under total crops. Yield per ha varies from 500 to 600 kg. The total yield ranged between 13 to 14 million tonnes per annum as against world production of 55 to 60 million tonnes. This contributed around 8% of the entire foodgrain production of the country. Except 9%, rest of the area under pulses is unirrigated. The share of the arhar in the annual production of pulses in 1989-90
was 21.4% (2.7 million tonnes).

The annual growth rate of pulses has been much slower as compared to other foodgrains. It has been only 0.74% as against 2.7% in cereals during the period under 1967-68 to 1988-89. Its production has stagnated between 11 and 14 million tonnes over the years. The targets and production of pulses for the last six years were shown in Table 1.

Table 1. Target and production of pulses from 1985-90.

<table>
<thead>
<tr>
<th>Year</th>
<th>Target (in million tonnes)</th>
<th>Production (in million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985-86</td>
<td>13.5</td>
<td>13.4</td>
</tr>
<tr>
<td>1986-87</td>
<td>14.0</td>
<td>11.7</td>
</tr>
<tr>
<td>1987-88</td>
<td>14.5</td>
<td>11.0</td>
</tr>
<tr>
<td>1988-89</td>
<td>13.5</td>
<td>13.8</td>
</tr>
<tr>
<td>1989-90</td>
<td>14.7</td>
<td>12.6</td>
</tr>
<tr>
<td>1990-91</td>
<td>15.0</td>
<td>14.2</td>
</tr>
</tbody>
</table>

Indian diet primarily consists of cereals and pulses which supplies on an average, over 75% of caloric, 85% of protein, most of the thiamines and niacin, 70% of iron and about 30% of fat. As the nation progresses towards a favourable balance sheet in its food production, there is also increase in awareness of the problem of malnutrition. The average Indian diet is not only insufficient in calories, it is also unbalanced. The prevalence of protein malnutrition
appears to be widespread in the economically handicapped section of the population. The shortage of protein in early stages causes stunted growth of all parts of the body including brain and nerve tissue. A person living on nutritious diet needs much less quantity of food as compared to person living on a diet that is deficient in necessary nutrients. Obviously, this can have a serious implication on the nation's future food production requirement. For solving these problems, perhaps, pulses are the cheapest and most practical means at the present stage of our economic development. In India, majority of the people are vegetarian deriving about 86% of their protein requirements from plants (Asthana, 1981) and pulses appear to be the major contributors. They contain about 20-30% of protein on dry basis which is nearly three times the value found in the cereals. The protein present in cereals and pulses differ in their amino-acid composition and make food each other's deficiency. Pulses contain a good amount of lysine and other amino-acids in which cereals are deficient (Gopalan et al., 1977). Hence production and consumption of more pulses is now widely recognized to be the cheapest and most practical way of improving people's nutrition as well as for meeting the food shortage in the country.

In addition, being the legumenous crop, it helps in improving soil fertility by fixing atmospheric nitrogen. Some of the pulses also serve as excellent forage and grain concentrates and some of them are excellent green manure crops adding the much needed humus and the major plants nutrients to the soil.
Hence the Government of India* has rightly conceived to make special efforts to increase the production of pulses under the revised 20 Point Programme. The strategy adopted was:

1. Introduction of pulse crops in irrigated farming system;
2. Bringing additional area under short duration varieties of summer moong and urd in summer season with irrigation and in rabi following rice by utilising the residual moisture;
3. Inter-cropping of arhar in soyabean, bajra, cotton, sugarcane and groundnut, both under irrigated and unirrigated conditions;
4. Multiplication and use of improved pulse seeds, use of phosphatic fertilisers, rhizobium culture and adoption of plant protection measures;
5. Improved post-harvest technology; and
6. Price support.

The scheme provides financial assistance to the farmers by way of subsidies on certified truthfully labelled seed, plant protection chemicals/equipments, operational charges and production and distribution of rhizobium culture as well as irrigation charges for summer moong production. In addition, assistance is also provided to the state government for laying out demonstrations and production of breeder/foundation seeds so as to motivate the farmers to adopt the improved package of practices in pulse crops.

India* 1984, Publication Division, Min. of Inf. Broadcasting, Government of India.
To improve production and productivity, a centrally sponsored scheme; National Pulses Development Programme (NPDP) was launched in 24 states and two Union Territories during the Seventh Plan. This programme is being continued. Pulses are also covered under the Special Foodgrains Production Programmes (SFPP) in 13 states to ensure (a) plant protection; and (b) expansion of area under summer moong and urd.

In addition, Pulses Development Programme constitutes a technology mission in itself. The main thrust of the NPDP is on (i) Improving existing cropping system, (ii) Organisation of front line or general demonstration, (iii) producing pulses seed through Seed Village Programme and (iv) distribution of seed minikits/distribution of certified seeds, chemicals and agricultural implements and dal processing machines.

Keeping in view the gap in demand and supply of pulses in the country, a production target of 15.5 million tonnes was fixed for 1991-92. The target for the Eight Plan is expected to be fixed at 23 million tonnes. For the current kharif season, the strategy for increasing production includes area coverage under early arhar varieties, utilisation of kharif fallows, inter-cropping and increased use of inputs for increasing production and productivity.

Cultivation of summer moong/urd has become popular in some states. To encourage the practice, seed kits at concessional rates have been supplied to farmers. Besides, price support/market intervention measures are also being adopted to increase production of pulses to achieve a higher level of per capita availability of pulses in the country.
One of the immediate adverse effects of the July 1991 rupee devaluation was that import cost of pulses had gone up by as much as Rs.1500 to 2000 per tonne. Most of the pulses in the international market are quoted between $300 to 400 per tonne. Consequently, the import of pulses has come almost to a standstill. Also the import duty of 10 per cent on pulses remained unaltered in the budget. The imports of the pulses in this year will also be affected by the Reserve Bank's import compression measures. With the availability of the new crop moong in August, 1992 there may be a further slow down in the imports. But overall shortage may be aggravated.

For meeting this situation efforts are being made to increase the pulse production in our country. In spite of our best efforts we have failed to maintain pace with its ever increasing demand of our masses. In view of the above discussed facts the increase in pulse production appears to be very urgent and necessary. Hence the proposed research 'A study of technological gap and the constraints in the adoption of pulse crops technology among farmers of district; Bulandshahr, U.P.' was outlined with the following specific objectives:

1. To study the level of adoption of pulse technology on farmer's fields.

2. To examine the magnitude of the technological gap in the adoption of pulse technology.

3. To study the relationship of communication sources towards technological gap in pulse technology.
4. To study socio-psychological factors as determinants of farmers attitude towards adoption of pulse technology.

5. To study the constraints coming in the way of adoption of improved technology of pulse production.

6. To develop a suitable extension strategy to bridge the gap in the adoption of pulse crop technology by the farmers.

**Hypotheses**

1. There is no relationship between farm size and adoption of practices.

2. There is no relationship between socio-psychological variables of the respondents and their level of adoption of pulse technology.

3. There is no relationship between communication sources used by the farmers and their technological gap.

4. There is no relationship between socio-psychological variables of the respondents and their attitude towards adoption of pulse production technology.

**SCOPE OF THE STUDY**

The proposed research work is expected to explore the problems coming in the way of adoption of pulse production technology by the farmers. It will also try to find out technological gaps in adoption as well as those factors affecting the farmers attitude towards adoption of pulses crops. It will also attempt to diagnose some of those
communication sources that may have bearing upon the technological gaps in pulse production technology. Finally, based on above findings, it will attempt to produce a suitable extension strategy that may prove beneficial for bridging the gap in adoption of pulse technology in future. The findings may provide useful and potential strategy to the Government, the research scholars and others who are engaged in planning and execution of programmes of pulse production technology.

LIMITATIONS OF STUDY

1. The study was conducted in only one district of Western Uttar Pradesh.

2. The present study was limited to major crops i.e. Arhar and Moong.

3. Inspite of repeated visits by the investigator to the villages for interviewing the selected heads of the families, some of them could not be contacted.

4. Some of the farmers were not able to give correct and straightforward answer and information due to lack of knowledge and illiteracy.