

## **New Techniques for Measuring the Degree of Commercialization of Farming: An Example of Madhya Pradesh**

S.K. Sharma and Devendra Singh Thakur

### **Abstract**

*The paper envisages reviewing the concept of commercialization of agriculture and attempts to suggest some methods to measure it and to test them in Madhya Pradesh. The traditional concept of treating only non-food crops as commercial crops has become obsolete now when large quantity of food crops are entering into markets and their share in total arrival has increased enormously. In fact neither entire production of non-food crops is marketed nor is entire production of food crops un-marketed. Hence the concept of commercial crops is not static but a dynamic one and requires modification. It is not the crop itself but the purpose of its production that places any crop in the class of commercial crops. Therefore the proportion of area under non-food crops is incapable of measuring the degree of commercialization. To incorporate food crops, two methods - proportion of value and weighted index have been proposed in this article and they have been tested citing example of Madhya Pradesh.*

Commercialization of farming means orientation of farming from subsistence to commercially remunerative farming. Usually agriculture is seen either as a way of life or as a way of earning. It is more an occupation than the business of those engaged in it. In the developed countries with low population pressure of the main objective of agriculture is to earn money out of farming. Therefore, agriculture is more oriented towards market. Low pressure also facilitates surplus production of agricultural produce. Commercial grain farming of U.S.A., Australia and some of the European countries is good example of this type of farming. On the other hand, in most of less developed countries, agriculture is way of life of the farmers and thus most of them are still in the subsistence class. These subsistence farms

produce barely enough to meet the basic requirements of the family. To increase the agricultural productivity is, therefore, the urgency and also solution of a host of the contemporary problems. Most of such areas, in order to raise the production levels, are coming forward to adopt agricultural innovations including yield-raising inputs, modern methods and techniques of farming, management and marketing. The increase in agricultural production and improvement in the productivity of land are, by and large, dependent on adoption of these innovations that involves a large amount of capital along with other changes in socioeconomic structure. Thus capital generation has become an urgency of modern agriculture. Further, other dimensions of the economy and society are changing very fast and, in consonance

with them, the level of standard of living is also raising. Programmes on employment generation and rural industrialization have also facilitated and necessitated producing a variety of agricultural raw materials. Thus it has become social imperative to make traditional farming an economically gainful employment. As a way out, farmers are turning to make their farming market oriented.

Increasing use of inputs and changing orientation of farming have generated two changes in cropping pattern. Firstly, specialization in production of crops most suited to the existing ecological conditions is increasing, resulting in reduction in diversification of agriculture and emergence of core areas of concentration of various crops. And as such, supremacy of superior food-grains remains unchanged and their production has increased tremendously. But the objective of production of these crops is shifting towards marketing. Secondly, wherever possible cropped area is shifting from foodgrains to non-foodgrains, resulting in increasing area under so-called commercial crops.

### **Objectives of the Study**

In this perspective, the paper envisages (i) to review the prevalent concept of commercialization of agriculture in the country, (ii) to suggest some methods to measure the level of commercialization of farming, and (iii) to present spatial variation in degree of commercialization of farming employing above methods in Madhya Pradesh.

### **Methodology**

Spatial variation in commercialization of farming is analyzed using data pertaining

to area and production of crops published by the Directorate of Agriculture, Government of Madhya Pradesh, Bhopal and Commissioner, Land Records and Settlements, Gwalior. Area of crops has been converted into proportion of the total cropped area. At the same time, value of agricultural produce has been calculated on district level using the support prices of different crops for the year concerned.

Along with them, data of arrivals of agricultural commodities at each *mandi* (*agricultural market*) of the state have been obtained from Mandi Board, Bhopal and value of arrivals of different agricultural produce at *mandis* has also been calculated using the support prices. With the help of these data spatial variation in degree of commercialization of farming has been discussed.

### **Concept of Commercial Crops**

Traditionally, only non-food crops are treated as commercial crops in India while even the production of cereals like wheat has been treated commercial farming in western countries. No doubt, non-foodcrops are still produced primarily for marketing but such a classification is not valid in present time. It is because, as mentioned earlier, food crops are also entering into markets and their share in total arrival has increased enormously. For example, in Madhya Pradesh, more than one-fourth (24.3 per cent, 2274.7 thousand tonnes) of the total wheat produced in the state was sold in the mandis during 1999-2000 (Table1). Similarly, 21.83 per cent of rice, 121.93 per cent of lentil, 51.22 per cent of tur and 55.6 per cent of gram produced in the state reached to mandis in the same year.

**Table 1:** Arrivals of Agricultural Produces to Mandis and their share in Total Production, 1982-83 and 1999-2000. [Arrivals in Thousand Tonnes]

	1982-83			1999-2000		
	Arrivals			Arrivals		
	Quantity 000 Tonne	%	% of Production	Quantity 000 Tonne	%	% of Production
Soyabean			53.8	3512.4	36.7	74.05
Wheat	393.0	13.2	10.5	2274.7	24.3	26.19
Gram	661.8	22.2	42.0	1411.9	15.1	55.6
Fruits, Veg. etc.	-	-	-	1054.8	11.3	-
Cotton	327.8	11.0	57.6	713.8	7.6	101.3
Paddy	139.8	4.7	13.7	373.3	4.0	21.83
Lentil	-	-	-	313.0	3.4	121.93
Peas	-	-	-	198.2	2.1	187.51
Rape-Mustard	101.8	3.4	85.3	154.1	1.6	25.67
Tur	175.8	5.9	59.0	138.2	1.5	51.22
Teora	-	-	-	103.0	1.1	166.94
Moong-Urad	169.5	5.7	83.9	89.6	1.0	56.07
Groundnut	110.8	3.7	66.6	40.9	0.4	18.43
Linseed	74.8	2.5	70.0	16.9	0.2	18.21
Jowar	129.2	4.4	9.3	18.2	0.2	3.3
Sesamum	-	-	-	13.2	0.1	41.7
<b>Total</b>	<b>2979.1</b>	<b>100.0</b>		<b>9340.0</b>	<b>100.0</b>	<b>46.30</b>

Sources: (i) Directorate of Agriculture, M.P., Bhopal Agricultural Statistics, 1983. (ii) <http://mp.mandi.board.com/agri> info year as on 1999-2000.

As a group, food-crops constituted only 36.1 per cent of total arrivals to mandis in 1982-83, which increased to 58.1 per cent in 1999-2000. Under these circumstances, traditional classification of commercial crops does not remain valid today. Food crops such as wheat, rice, various pulses and fruits and vegetables are reaching to mandis in increasing quantity. Therefore these crops must be included in the list of commercial crops. On the other hand, there are many non-food crops that are produced to meet just the needs of producers. Most of the traditional oilseeds are of this nature. It is evident from the above table that only

less than one-fourth of traditional oilseeds arrived to mandis in 1999-2000. Out of the total production, only 41.7 per cent of the sesame, 25.67 per cent of rape & mustard, 18.43 per cent of groundnut and 18.21 per cent of linseed were marketed. It means the farmer retains major portion of their production for their consumption. Thus, neither entire production of non-food crops is marketed nor entire production of food crops is un-marketed. Reality is between these two. With the increasing use of capital-intensive inputs for raising productivity, farmer is bound to sale some portion of its agricultural produces for purchasing

inputs. Some of their agricultural produces are sold by farmers also to meet other social and cultural obligations. Therefore, farmer tries to concentrate to produce those crops, which give highest yield and cash return under the existing physio-social situations. It may not necessarily be non-food crops. Hence the concept of commercial crops has to be considered not as static but a dynamic one as it changes with the development of the society. In fact, it is not the crop itself but the purpose of its production that places any crop in the class of commercial crops.

### Methodology for Determination of Commercialization of Farming

There has been practice to consider the area under non-food crops for measuring the level of commercialization in any region. Proportion of total cropped area under these crops is supposed to give index of commercialization of farming. It can be expressed as follows:

$$DC = \left\{ \frac{Anfc}{Gca} \right\} 100$$

Where

DC= Degree of commercialization;

Anfc= total area under non-food crops and

Gca = Total cropped area.

Of course, it gives fairly good spatial picture of commercialization. But under the existing situation as mentioned above, this method is not capable of presenting the real picture. It is because it gives undue emphasis on non-food crops and that too on area under them. Not all non-food crops reach to market. At the same time, it ignores the share of food crops, which has

been increasing enormously in marketing. To remove this lacuna, another method has been evolved for the present study. Value of arrivals of different agricultural produces to mandis has been calculated on district level using the support prices of different crops for the year concerned. In all, eighteen crops are reported to reach mandis. Similarly, values of total production of each crop for different districts have been calculated using the support prices of respective crops. Then value of arrivals is converted as percentage of the value of the total production. It can be expressed as:

$$DC = \left\{ \frac{Va}{Vtp} \right\} 100$$

Where

DC is Degree of Commercialization;

Va is total value of all arrivals of produces to mandis of the district and

Vtp means value of total production of the same crop

For example, total value of arrivals (Va) of 18 agricultural commodities brought to mandis of the state is Rs. 104.86 billion and total value of total production (Vtp) of those crops in the state is Rs. 198.71 billion in 1999-2000. Thus degree of commercialization arrives at  $(104.86/198.71 \times 100) = 52.77$  per cent for the state as a whole.

Value of marketed agricultural produces suffers from another drawback. Price of different crops varies widely. Therefore another method of measuring degree of commercialization is tried here. It is based on the proportion of the produce arrived at mandis. Arrivals of different agricultural produces brought to mandis are converted as proportion of total production of respective crops in the district. If proportion of

arrival is more than 1.0 of total production of the respective crop it is kept 1.0 only, presuming that all production is sold. This proportion is weighted with the per cent area under respective crop and converted into percentage. Weighted value of all crops under consideration is summed to obtain weighted score. It can be expressed as below:

$$DC = \sum \left\{ \frac{Q_{tp}}{Q_a} \right\} C \quad 100$$

Where

DC is the degree of Commercialization,

Q<sub>tp</sub> is the quantity of total production of the crop,

Q<sub>a</sub> is the quantity of arrival of the same crop and

C means per cent area under the crop GCA

For example, in Madhya Pradesh as whole, total arrival (Q<sub>a</sub>) of rice to mandis of the state is 3,73,272 tonnes, total production of (Q<sub>tp</sub>) of rice in the state is 17,10,100 tonnes and proportion of gross cropped area under rice is 8.33 per cent in 1999-2000. Thus weighted index value would be  $\left( \frac{373272}{1710100} \times 8.33 \right) \times 100 = 181.81$ . Similarly index for other crops can be obtained and summation of these indices would present the degree of commercialization

### Spatial Variation in Degree of Commercialization

Spatial pattern of degree of commercialization of farming measured using the above three methods varies to a great extent. It is clear from the following analysis.

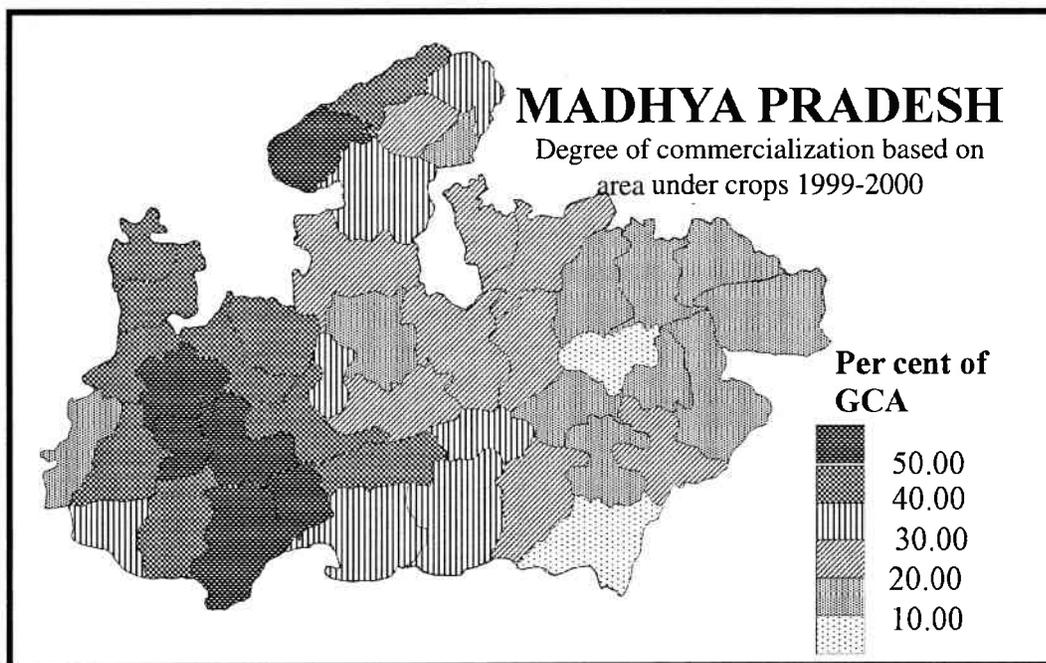
### 1. Degree of Commercialization based on Proportion of Area

For this purpose, area under sugarcane, fruits, vegetables, spices, oilseeds and plantation crops has been taken into consideration. Total area under these crops in 1999-2000 has been calculated as percentage of the gross cropped area for each district. For example, in Madhya Pradesh as whole, gross cropped is 20,418,767 hectares and total area under above crops is 6,904,450 hectares in 1999-2000. Degree of commercialization thus obtained is  $\left( \frac{6,904,450}{20,418,767} \times 100 \right) = 33.8$  per cent. Similar values have been calculated for all 45 districts of the state and are shown in figure 1. It ranges from 7.0 per cent in Katni to 57.3 per cent in Sheopur district. On this basis district can be grouped into three broad classes as follows.

#### Highly Commercialized Districts

Districts with proportion above 40.0 per cent of the total cropped area under these crops are classed as highly commercialized districts. There are sixteen such districts in the state. These districts are distributed in three areas (Fig 1): (i) major portion of the Malwa plateau (10 districts) in the western, (ii) adjoining lower Narmada valley and the Nimar plain (4 districts), and (iii) the Chambal valley (two districts). Out of these, proportion of commercial crops more than 50% in five districts. These are Dewas (51.4), Ujjain (52.1), Harda (52.3), Indore (53.1), Khandwa (54.2) and Sheopur (57.3 per cent). They form the core of the commercialized belt.

The Malwa and the Narmada valley are major tracts of soyabean production in the state. Cotton production is also concentrated



**Fig. 1:** Madhya Pradesh - Degree of Commercialization based on area under crops

in Indore and Ujjain divisions. Some other plantation crops such as opium and tobacco are also produced in the Malwa region particularly in the Ujjain division. These crops have facilitated agro-based industrial development in the area. Indore, Ujjain, Ratlam, Dewas, Khandwa and Burhanpur developed as cotton textile centres because of cotton production there. Later, a large number of soya-based industrial units have been established in these two regions. Because of industrialization and urbanization demand as well production of fruits, vegetables and spices increased rapidly in these areas. Commercialization is based on oilseeds in the Chambal region also but the crops are different. In stead of soyabean, rape and mustard are dominant in this region. Morena and Sheopur are known for oil industry.

### **Medium Commercialized Districts**

The traditional commercial crops range between 20.0 to 40.0 per cent of gross cropped areas in these districts. There are 16 districts in this class. These districts extend over the eastern Malwa, Madhya Bharat plateau, Bundelkhand uplands and central Satpura region. Though area under soyabean is increasing rapidly in these areas as yet it has not overshadowed the food crops. Proportion of area under oilseeds is comparatively low. Crops like cotton, tobacco and opium are not grown in these areas. However, sugarcane is popular in the Jabalpur division. Similarly, vegetables and spices have comparatively higher proportion of area in Sagar, Bhopal and Gwalior divisions.

### **Low Commercialized Districts**

Degree of commercialization is low to very low in thirteen out of 45 districts of the State. Katni, with only 7.0 per cent of total cropped area under these crops, is at bottom followed by Balaghat (9.4 per cent). Ten of these districts form a compact belt in the eastern part of the state, extending from Rewa in the north to Balaghat in south and cover Panna, Rewa, Sidhi, Satna, Shahdol, Umaria, Katni, Jabalpur, Mandla and Balaghat. Hilly and dissected terrain, shallow and infertile soils and low level of economic development have made this region as predominantly subsistence agriculture. It is a belt of the kharif food crops. Only three districts with low proportion are outside this belt. These are Jhabua- a tribal district in the west, Vidisha in the centre and Datia in the north.

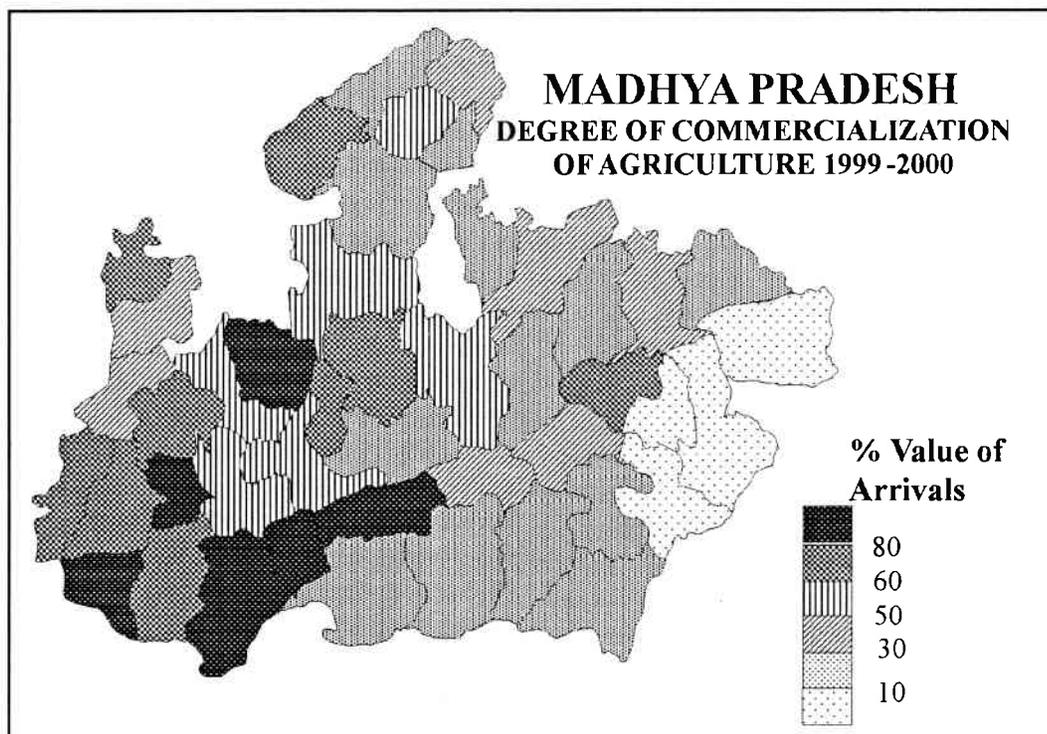
### **2. Degree of Commercialization based on Proportion of Value**

The above classification of districts into classes of commercialization of farming is based on areal extent of crops only. It ignores foodgrains though the proportion of foodgrains is gradually increasing in agricultural commodities of the state. At the same time, not entire production of non-food crops is sold in the market, considerable proportion of it is used for home consumption by peasant community. For instance, out of the total production 26.2 per cent of wheat, 21.8 per cent of rice, 55.6 per cent of gram and 51.2 per cent of tur was brought to mandis during 1999-2000. On the other hand though traditionally considered as commercial crops, more than 25% of the soyabean, 75% of rape-mustard and almost 80% of groundnut and linseed did not enter mandis for sale. It means simply

area under non-food crops can not be a true index of commercialization. There is need to consider the marketing of foodgrains on one hand and to reduce undue weightage to non-food crops on the other. In order to circumvent this problem the share of marketed quantity of agricultural produces to total production has been considered as an alternative variable while identifying the levels of commercialization. It ranges from as low as 4.3 per cent in Shahdol district to 98.42 per cent in Indore district. Proportion in Barwani district is as high as 315.15 per cent. It may be because of the cotton brought from Maharashtra to mandis of this district. State average is 52.77 per cent. Higher percentages, particularly above 100 indicate that at the given mandi crops sold are not only from the State but there is some import from the adjoining States. On the basis of this districts can be put into three classes as follows.

### **Highly Commercialized Districts**

Proportion of value of crops sold is above 60.0 per cent of total value of crops produced in fifteen districts. It is above 80.0 per cent in six of them. Distribution pattern of these districts is different from the one determined on the basis of area of non-foodgrain crops (Fig. 2). The Narmada valley and the Nimar plain come up as most commercialized area in the state. Eight districts of the Malwa also belong to this class but Mandsaur, Ratlam, Shajapur, Dewas, and Sehore, having high proportion of area of commercial crops, cost their status as highly commercialized Districts. Contrary to it, Bhopal and Barwani with medium proportion of area have jumped to this high class. Not only that Jhabua and Vidisha districts have low proportion area



**Fig. 2: Madhya Pradesh - Degree of Commercialization of Agriculture**

of commercial crops but belong to high-commercialized class in term of proportion of value of crops brought to mandis. Sheopur district of the Chambal basin and Kanti in the upper Narmada valley also have proportion of value of sold crops above 60 per cent.

#### **Medium Commercialized Districts**

Nine districts have proportion of sale value between 40.0 to 60 per cent of value of total production. Six of them (Mandsaur, Ratlam, Shajapur, Dewas, Sehore and Sagar) are in the Malwa region and most of them have high proportion of area of commercial crops. Guna, Gwalior and Satna also belong to this class.

#### **Low Commercialized Districts**

Total twenty-one districts belong to this class. Districts of this class are spread over the middle and eastern Satpura region, Baghelkhand plateau, and Bundelkhand upland and major portion of the Madhya Bharat plateau. Out of these, two districts (Raisen and Morena) have high proportion, ten districts (Chhatarpur, Narsinghpur, Bhind, Betul, Shivpuri, Damoh, Tikamgarh, Chhindwara, Seoni, and Dindori) have medium proportion and nine districts (Sidhi, Shahdol, Umaria, Mandla, Jabalpur, Balaghat, Rewa, Panna and Datia,) have low and very low; proportion of area under commercial crops.

Thus all districts except three with low proportion of area under commercial

crops are low commercialized in terms of value also. Similarly, districts with lower medium proportion of area also have drop down to lower class of value. There are five exceptional cases. Vidisha, Jhabua and Katni districts have low percentage area under commercial crops but proved to be highly commercialized in terms of value. Such a high level may be due to the arrival of agricultural produces to the mandis of these districts from surrounding districts and the neighbouring states. High agricultural productivity is one of the reasons. Contrary to this, Raisen and Morena have high proportion of area under commercial crops but low proportion of value of marketed agricultural produces. One of the possible reasons may be low productivity of commercial crops in these districts.

### 3. Degree of Commercialization based on Weighted Index

There is still one problem with the value method. There are several districts where quantity of arrival of certain commodities is much more than their production in the district. Few examples can be cited here. In Barwani, production of cotton was 49980 tonnes but arrival was 261287 tonnes, which works to be 522.8 per cent of production. It raised the district at first place. Similarly, arrival of cotton to mandis was 1671000 per cent of production in Sheopur and 206 per cent in Harda district. In case of soyabean, per cent of the marketed quantity to total district production was 195 in Damoh, 156 in Datia, 140 in Hoshangabad and 134.6 in Khandwa. Excessive arrival is not the characteristics of the local agriculture. This problem has been taken into account in the

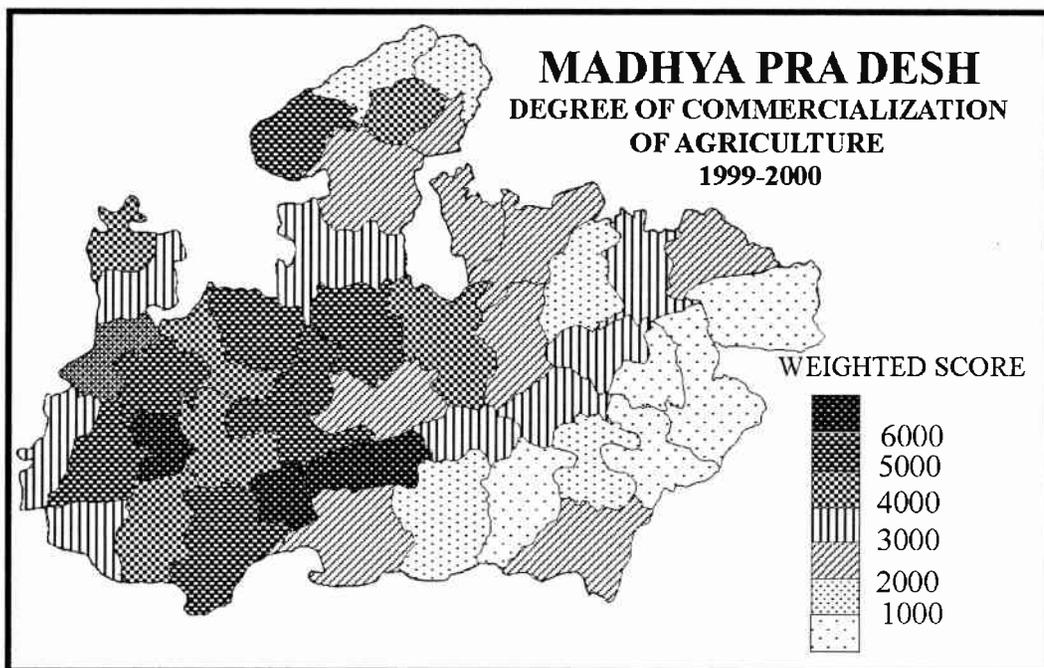


Fig. 3: Madhya Pradesh - Degree of Commercialization of Agriculture based on Weighted Score

weighted index method described above. Weighted index of commercialization has been calculated utilizing information of 1999-2000. This score ranges from only 349 for Shahdol district to 8579 for Harda district. State average is 4061. Out of 45 districts 18 have higher score than the state average while 27 are below this. Spatial pattern of these scores is presented on figure 3. Broadly it is very similar to the value map. However, there are certain remarkable deviations. Barwani district comes down to 18th rank in weighted score from first in terms of value of arrivals. It is because Barwani and other towns of this district are cotton mandis where cotton is brought from bordering Maharashtra state for sale. When mandi arrivals are weighted by area of crops in the district its superiority declined. It means mandis of Barwani sell more than what are produced in the district. But it has less effect on commercialization of farming. Similar is the case with Katni, Chhindwara, Khandwa, Khargone, Jhabua, Mandsaur, Rajgarh, Bhopal, Guna, Shivpuri, Morena, Bhind and Chhatarpur districts also. Because of the arrivals of agricultural produces from outside of the district boundary in these districts their degree of commercialization of farming is inflated when measured in term of value of arrivals. Contrary to it, certain districts improved their positions in weighted scores among them mention may be made of Sehore, Dewas, Sagar, Gwalior, Shajapur, Narsinghpur, Ratlam, Ujjain, Hoshangabad, Harda, Satna, Jabalpur, Damoh, Tikamgarh, Datia and Sheopur. But these changes in ranks do not make much change in spatial pattern. The Malwa plateau and Narmada valley emerge as highly commercialized areas by and large. Part of the Chambal basin also belongs to

this class. On the other hand, farming in eastern and southern parts of the state is still the least commercialized.

## References

- Acharya, S.S. (1998) Agricultural Marketing in India: Some Facts and Emerging Issues. *Ind. Jn. of Agri. Econ.* Vol. 53, No. 3, pp. 311-332.
- Chand, Ramesh, 1999, 'Agricultural Marketing Issues and Challenges', *Ind. Jn. of Agri. Econ.* Vol. 54, No.1, pp. 46-47.
- Dixit, R.S., (1990) '*Geography of Marketing and Commercial Activities in India*', Documentation on Research Information, New Delhi, Concept Publishing Company, New Delhi.
- Dixit, R.S., (2001) 'Analysis of Spatial Distribution of Regulated Agricultural Market', *Geog. Rev. of Ind.* Vol. 63, pp. 141-152.
- Dixit, R.S., (2001) 'Statistical Distribution and Pattern of Spatial Distribution of Regulated Agricultural Markets of Uttar Pradesh', *The Deccan Geogr.*, Vol. 39, No.2, pp. 13-26.
- Sharma, S.K. & C.K. Jain (1986) Agricultural Marketing in M.P. *Geographical Review of India*, Vol. 48, No. 3, pp. 59-69.
- Varghese, K.A., P.M. Sharma and Pravin Chaturvedi, (1968) Trends in Market Arrival vis-a-vis Production of Major Agricultural Commodities in Rajasthan, *Ind. Jn. of Agri. Econ.*, Vol. 53, pp. 403.

**S.K. Sharma**  
**Devendra Singh Thakur**  
 Department of Geography  
 Dr. H.S. Gour University  
 SAGAR (M.P.) 470 003