# ECONOMICS OF FARMING SYSTEM IN
# SOUTH - EAST RAJASTHAN

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## ABSTRACT

A characterization survey of 144 farmers was conducted during 2010-11 in Chittorgarh and Rajsamand districts of South-East Rajasthan. The major farming systems prevailing in Sub-humid Southern Plain and Aravalli Hills Zone (IVa) was crop + animal husbandry and crop + horticulture + animal husbandry. The findings showed that the net income/hectare increases with increase in size farm. The data also showed the per cent livelihood of different category of farmers in which all category farmers were getting their livelihood from crop production, which can be shifted to some other enterprise to some extent. Large farmers were getting Rs 49,852/- and Rs 37,385/- /ha more net income than small and medium category of farmers, respectively from crop + animal husbandry farming system while they were getting Rs 87,710/- and Rs 51,161/- /ha more from crop + animal husbandry + horticulture farming system. Non-availability of newly developed high yielding variety seeds was the most important constraint among all categories of farmers followed by imbalanced use of fertilizer in crop production. Lack of cross bred and exotic breed animals, artificial insemination and medical facilities for cattle in were the constraint in animal husbandry enterprise. Lack of availability of improved good planting materials suitable for local conditions was the important constraint followed by imbalanced use of fertilizers for all categories of farmers in horticulture enterprise.

## INTRODUCTION

Farming system represents integration of farm enterprises such as cropping system, animal husbandry, fisheries, forestry, poultry etc. for optimal utilization of resources bringing prosperity to the farmer. Farming system approach introduces a change in farming techniques for higher production from the farm as a whole with the integration of all the enterprises. A judicious mix of cropping system with associated enterprises like dairy, poultry, piggery, fishery, sericulture etc. suited to the given agro-climatic conditions and socio-economic status of farmer would bring prosperity to the farmer. Every farmer tries to choose the farm activities/enterprises depending upon physical and economic conditions prevailing in his ecosystem. Integration of various farm enterprises on the farm ensures growth and stability in overall productivity and profitability. It also ensures recycling of residues optimization of resource use, minimization of risk and generation of employment. The basic aim of integrated/ sustainable farming system is to derive a set of resource development management and utilization practices that lead to a substantial and sustained increase in agriculture production. Since farming system differ in different situations such studies should be location system specific. (Singh,1998). Several studies conducted on farming systems showed that farming system approach is better than conventional farming (Ravishankar, *et al*., 2007 and Singh *et al*., 2007).

As there is no scope for horizontal expansion of our agricultural land and agriculture, only alternative left is for vertical expansion through various farm enterprises requiring less space and time but given high productivity and ensuring periodic income especially for small and marginal farmers. Before conducting any research on farming system in an area, the first step of diagnosing of research-base of farmers and constraints is very crucial and has to play a pivotal role. In view of this, on-farm study on characterization and constraints analysis of farming sys-

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tem of Udaipur district of Rajasthan was undertaken with the objectives to identify and characterize the major farming systems of the study area, major constraints limiting the efficiency of different farming sub-systems and suggesting technological interventions for improving profitability.

## RESEARCH METHODOLOGY

For collection of information related to different aspects of farming systems, a survey was carried out during 2010-11 using pre-structured schedule. Survey was conducted by adopting stratified random sampling. Three stage stratified sample (Tehsil, Village and Farmer) was considered for the purpose of primary data collection on the sub-systems from the farmers. The different size groups of farmers i.e. small (80), medium (40) and large (24) were selected on the basis of probability proportion to each size groups (Table 1). Thus, a total of 144 farmers were selected from Chittorgarh and Rajsamand districts of South-East Rajasthan. The selected farmers were interviewed personally and information on existing farming system, economics of different enterprises and the constraints of different enterprises were identified. The data collected through survey were subjected to general statistical analysis.

**Table 1 A: Selected farmers in Chittorgarh district of Rajasthan.**

| Name of Block/ Village | | | Number of farmer | | |
| Tehsil | Village | Small | Medium | large | Total |
| --- | --- | --- | --- | --- | --- |
| 1.   Chittorgarh | 3 | 10 | 5 | 3 | 18 |
| 2.   Dungla | 3 | 10 | 5 | 3 | 18 |
| 3.   Bhadesar | 3 | 10 | 5 | 3 | 18 |
| 4.   Kapasan | 3 | 10 | 5 | 3 | 18 |
| Total | 12 | 40 | 20 | 12 | 72 |

**Table 1 B: Selected farmers in Rajasmand district of Rajasthan.**

| Name of Block/ Village | | | Number of farmer | | |
| Tehsil | Village | Small | Medium | large | Total |
| --- | --- | --- | --- | --- | --- |
| 1 Rajsamand | 3 | 10 | 5 | 3 | 18 |
| 2. Nathdwara | 3 | 10 | 5 | 3 | 18 |
| 3. Kankroli | 3 | 10 | 5 | 3 | 18 |
| 4. Ameth | 3 | 10 | 5 | 3 | 18 |
| Total | 12 | 40 | 20 | 12 | 72 |

## RESULTS AND DISCUSSION

### Existing Farming Systems

The major farming systems prevailing on all categories of farmers in Sub-humid Southern Plain and Aravali Hills Zone (IVa) are presented in Table 2. Data showed that crop + animal husbandry was the major farming system which was adopted by 66.00 % farmers of all the categories followed by Crop + animal husbandry + horticulture farming system (34.00%).They rear the milch animals to fulfill their domestic requirement and extra milk is sold to meet the miscellaneous expenditure.

### (i) Crop + animal husbandry farming system

It is obvious from Table 3 that group income/ hectare increased with increase in farm size. Large category of farmers obtained maximum gross income (Rs 92,457/- /ha) while small farmers were getting gross income of Rs 65,677/- /ha. Data also showed that expenditure incurred by large category of farmers was more (Rs 42,605/-ha) as compared to small category of farmers (Rs 28,292/- /ha) due to more risk bearing capacity of large farmers. Net income from crop+ animal husbandry enterprises also followed the same trend as gross income. Large farmers were

**Table 2: Major farming systems prevailing in the zone IVa.**

| S. No. | Major farming systems | | Category of the farmers | | Total |
|---|---|---|---|---|---|
| | | Small(0-2 ha) | Medium (2-4 ha) | Large(> 4 ha) | |
| 1. | Crop + animal husbandry | 34 | 32 | 29 | 95 (66.00%) |
| 2. | Crop + animal husbandry + horticulture | 14 | 16 | 19 | 49 (34.00%) |
| | Total | 48 | 48 | 48 | 144 |

Expenditure and income from different enterprises

getting Rs 49,852/- and Rs 37,385/- /ha more than small and medium category of farmers, respectively.

The data also showed per cent livelihood from crop production, which could be shifted to some other enterprises to some extent. As the size of farm increases per cent livelihood shifted from crop production to animal husbandry. In the study, large category farmers were setting 25.2 per cent income from animal husbandry while the small farmers were getting 29.4 per cent income from animal husbandry.

**Table 3: Expenditure and income from crop + animal husbandry farming system.**

| Category of farmers | Av. size of holding (ha) | Income by crops (Rs/ha) | Income byA.H. (Rs/ha) | Gross income (Rs/ha) | Total expendi-ture (Rs/ha) | Net income (Rs/ha) | Per cent livelihood C.P. | A.H. |
|---|---|---|---|---|---|---|---|---|
| Small | 1.03 | 45870 (26405)* | 15807 (10985)* | 65677 | 28292 | 37385 | 70.6 | 29.4 |
| Medium | 2.71 | 65380 (33407)* | 20805 (12080)* | 86185 | 40698 | 45487 | 73.4 | 26.6 |
| Large | 6.82 (37287)* | 68650 (12565)* | 23807 | 92457 | 42605 | 49852 | 74.8 | 25.2 |

*Figures in parentheses refer to net income by different enterprises. C.P.: Crop production; A.H: Animal husbandry

**Table 4: Expenditure, gross and net income from crop + animal husbandry + horticulture farming system.**

| Category of farmers | Average holding size (ha) | Gross income (Rs/ha) | Income by crops (Rs/ha) | Income by A.H. (Rs/ha) | Income by horticul-ture (Rs/ha) | Total expe-nditure (Rs/ha) (C+A.H. + H.) | Net income (Rs/ha) | Per cent livelihood C. | H. | A.H. |
|---|---|---|---|---|---|---|---|---|---|---|
| Small | 1.47 | 80808 | 33958 (29292)* | 18558 (12577)* | 28292 (18292)* | 28647 | 51161 | 43.5 | 31.8 | 24.6 |
| Medium | 2.78 | 121400 | 51680 (31200)* | 35560 (24100)* | 34160 (22200)* | 43900 | 77500 | 40.3 | 28.6 | 31.0 |
| Large | 5.00 | 132115 | 80150 (53300)* | 37400 (26300)* | 14565 (8110)* | 44405 | 87710 | 60.8 | 9.2 | 30.0 |

*Figures in parentheses refer to net income by different enterprise. C.P.: Crop production; A.H: Animal husbandry and H.: Horticulture.

**(2) Crop + animal husbandry + horticulture**

Data presented in Table 4 revealed that net income/hectare in different category of farmers from crop + animal husbandry + horticulture enterprises. It was noticed that highest net income (Rs 87,710/- / ha) was obtained by large category of farmers in which share of Rs 53,300, Rs 26,300 and Rs 8,110/-/ha was from crop production, animal husbandry and horticulture, respectively. Whereas the lowest net income was obtained by small farmers (Rs 51,161/- / ha). As the size of the farms holding increases, the per cent livelihood shifted from crop production to horticulture and /or animal husbandry. It indicates that farmers also tend to earn from the other enterprise than crop production. This is a healthy sign where the per cent livelihood can be shifted more towards horticulture by providing them good type of planting materials from different organization like SAU's, NGO's or other private agency. This is the realistic situation in conducting survey where we can clearly see the shift of farming system.

**Major constraints leading to low productivity / returns from different enterprises**

Non-availability of newly developed high yielding variety seeds is the most important constraint among all categories of farmers followed by imbalanced use of fertilizer (Table 5) under crop production component. About 91 % farmers were facing non-availability of newly developed high yielding variety seeds as constraint, 84 % farmers facing imbalanced use of fertilizers as constraint and about 51 % farmers facing lack of knowledge of improved package of practices as constraint. Kadam *et al.* (2003), Singh and Singh (2005) and Choudhary *et al.* (2007) also reported similar findings.

Data also showed that major constraint in animal husbandry enterprise was lack of crossbred and exotic breed animals, which were faced by 87.7 % farmers, followed by lack of artificial insemination and medical facilities for cattle.

Data further showed that lack of availability of

**Table 5: Ranking of major constraints in different category farmers.**

| | Constraints | Category of farmers | | | Total |
|---|---|---|---|---|---|
| | | Small | Medium | Large | |
| **A. Crop** | | | | | |
| I | Non-availability of newly developed high yielding variety seeds | 35 | 32 | 15 | 82 (91.1%) |
| II | Imbalanced use of fertilizers | 34 | 30 | 12 | 76 (84.4%) |
| III | Lack of knowledge of improved package of practices | 22 | 14 | 10 | 46 (51.1%) |
| **B. Animal husbandry** | | | | | |
| I | Lack of crossbred and exotic breed animals | 35 | 30 | 14 | 79 (87.7%) |
| II | Lack of Artificial insemination and medical facilities for cattle | 30 | 22 | 16 | 68 (75.5%) |
| III | Improper maintenance balance feeding and lack of organized co-operative societies | 28 | 20 | 12 | 60 (66.6%) |
| **C. Horticulture** | | | | | |
| I. | Lack of availability of improved good planting material suitable for local Conditions | 33 | 29 | 15 | 77 (87.5%) |
| II | Imbalanced use of fertilizers | 30 | 21 | 15 | 66 (78.1%) |
| III | Lack of knowledge of improved package of practices | 27 | 20 | 10 | 57 (68.7%) |

* Figures in parenthesis indicate per cent value.

improved good planting materials suitable for local conditions was the important constraint for all categories of farmers in the horticulture component. This constraint accounts for 87.5 per cent farmers. Next important constraint was imbalanced use of fertilizers and accounts for 78.1 % farmers. One another constraint was lack of knowledge of improved package of practices.

**Necessary Technological Interventions**

The probable technological interventions for higher returns from different enterprises may be:

A.   Crop production

(i)   Agriculture department, co-operative society and NGO's should supply seed of improved variety at panchayat samiti/village level prior to sowing.

(ii)   Village level demonstrations of improved technology should be conducted for balanced use of fertilizers.

(iii)   Trainings for improvement in knowledge about package of practices.

B.   Animal husbandry

(i)   Exotic breeds suitable for local condition be made available at village level breed improvement programme.

(ii)   Medical facilities and buffer stock for feed and fodder for adverse condition should be maintained in the area.

(iii)   Marketing/collection center of milk and milk products should be developed at village levels.

C.   Horticulture

(i)   Supply of newly developed varieties (short duration, resistant to pest and disease), fertilizers and plant protection measures.

(ii)   Village level demonstrations of improved technology should be conducted for balanced use of fertilizers.

(iii)   Training programmes should be conducted for the improvement of the knowledge regarding package of practices for horticultural crops.

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