

# Farming System Analysis under Various Eco-System with Photograph

## **FARMING SYSTEM ANALYSIS OF IMPHAL WEST DISTRICT, MANIPUR STATE.**

### **About farming systems:**

A *farming system* is defined as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Depending on the scale of the analysis, a farming system can encompass a few dozen or many millions of households.

The classification of the farming systems of developing regions has been based on the following criteria:

- available natural resource base, including water, land, grazing areas and forest; climate, of which altitude is one important determinant; landscape, including slope; farm size, tenure and organization; and
- dominant pattern of farm activities and household livelihoods, including field crops, livestock, trees, aquaculture, hunting and gathering, processing and off-farm activities; and taking into account the main technologies used, which determine the intensity of production and integration of crops, livestock and other activities.

### **Part - I**

#### **1. Agricultural characteristics of the KVK, Imphal West District**

##### 1.1.1 A brief description of the district (in about 250 words)

Imphal west District is valley area surrounded by Senapati District on the north, on the east by Imphal East and Thoubal districts, on the south by Thoubal and Bishnupur Districts, and on the west by Senapati and Bishnupur Districts. The district headquarters is Imphal and there are 3 subdivisions. The district enjoys comfortable temperature throughout the year; not very hot in summer and not very cold in winter. Average temperature is 20.4° C and ranges from minimum of 0° C to maximum of 36° C. The whole district is under the influence of the monsoons characterized by hot and humid rainy seasons during the summer, and cool and dry seasons during the winter. The average annual rainfall is 108.5 cm to 143.4 cm

The valley area of Imphal West district is fertile land and is mainly made up of alluvial soil of recent origin. The valley was once full of swamps and marshy lands, the important ones being Lamphelpat, Takyelpat, Sangaipat, Kakwapat, Poiroupat (pat means lake). The soils are mainly made up of shallow black, brown and alluvial soils which have been technically classified as *Udalfs-Ochrepts* and *Orchrepts-Aquepts-Fluvents*. The district receives annual rainfall of 1192.2 mm/year. The district gets rainfall from the South-West monsoon. Foot hills constitute negligible area and is left fallow.

The population of Imphal West District 4,39,532 (Census 2001) and No. of inhabited Village is 134 (2001 census). Out of the total work force 39% are in agricultural sectors and 61% in non-agricultural sectors.

Rice is the main crop of the state as well as the district followed by rabi crops like rapeseed mustard, pea and other winter vegetables. As Imphal west district has vast area of water bodies (Villages located at the periphery of the loktak lake) fishery is an important enterprise giving good profit.

- 1.1.2 Position in relation to longitude and latitude: 93° 54' E and 24° 45' N
- 1.1.3 Altitude from MSL : 774 m
- 1.1.4 Boundaries of your district : E : Imphal East Dist. W : Thoubal Dist.  
N : Senapati Dist. S : Thoubal Dist.  
NE: Ukhrul Dist. SE: Imphal East Dist.  
SW: Thoubal Dist. NW: Senapati
- 1.1.5 Total population : 2,08,368
- 1.1.6 Area of the district : 519 sq km
- 1.1.7 Population density : 856/sq.km (to be calculated based on total population and area of the district)
- 1.1.8 Literacy percentage : 66.94
- 1.1.9 Status of agriculture : Rainfed (Rainfed/irrigated/Shifting etc)
- 1.1.10 Farmers
- a. Big farmers : 205 (nos)
- b. Small farmers : 5810
- c. Marginal farmers : 13120
- d. Agricultural labourers : 51,278
- 1.1.11 Farm labour mobility
- a. Is sufficient farm labour available in your district : YES
- b. If 'NO' from which places do they come from? : NA
- c. If 'YES' whether they do work in nearby or other districts also? : YES
- d. if 'YES' to which districts they go for work? : Imphal East, Thoubal and Bisnupur.

## 1.2 Physiography

- 1.2.1 Highlands : - (in ha)  
 1.2.2 Midlands : 20.76 sq. km  
 1.2.3 Lowlands : 31.14 sq. km  
 1.2.4 Hilly tract : -  
 1.2.5 General nature of the terrain (in about 50 words)

The Imphal West District falls in the Category of Manipur valley region. It is a tiny plain surrounded by plain and hill districts. Plain area consists of medium low land, midlands and lowlands. Low land area comprises major portion which is at the periphery of the loktak lake. The valley area of Imphal West district is fertile land and is mainly made up of alluvial soil of recent origin. Hills and foot hills have red soil containing medium to high organic matter and suitable for cultivation of fruits and vegetables. Soils of both hill and valley are acidic ranging from 4.5 to 5.5 pH.

## 1.3 Climates (Please tick the appropriate one)

- 1.3.1 Arid/Semi-arid/Not Applicable  
 1.3.2 Tropical/Sub-tropical/Not Applicable   
 1.3.3 Temperate/Sub-temperate/Not Applicable   
 1.3.4 Humid/Sub-humid/Not Applicable  
 1.3.5 Pattern of rainfall in different months (Provide as high, medium or low)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
L	L	M	M	H	H	H	H	M	M	L	L

- 1.3.6 Did you observe any special weather phenomenon in your district? If yes, please provide a short write up in about 100 words. : NA  
 1.3.7 Maximum and minimum temperatures recorded : Max: 29.4 Min: 6.1 (average of 10 yrs.)  
 1.3.8 Critical periods for plant growth in your district (Provide major crop wise)

Sl. No	Crop	Critical periods of growth	Coinciding calendar month(s)
1.	Rice	Flowering and PI stage	August and September
2.	Maize	Silking	June
3.	Potato	Germination and tokenization	November and February
4.	Pea	Vegetative stage	January and February
5.	Rape and Mustard	Flowering	January

## 1.4 Soils

- 1.4.1 Which are the Soil group classifications present in your district?  
 1. Alluvial soil  
 2. Black soil  
 3. (Add more if any)

- 1.4.2 Black soils : Present (NA ha) / Not Present  
 1.4.3 Red soils : Present (NA ha) / Not Present  
 1.4.4 Alluvial soils : Present (NA ha) / Not Present  
 1.4.5 Sandy soils : Present (NA ha) / Not Present  
 1.4.6 Laterite soils : Present (NA ha) / Not Present  
 1.4.7 Saline and alkaline soils : Present (NA ha) / Not Present  
 1.4.8 Acid soils : Present (NA ha) / Not Present  
 1.4.9 Soil fertility status (in general) : High/Medium/Low ✓

### 1.5 Irrigation

- 1.5.1 Area under irrigation : 2734.46 ha  
 1.5.2 Irrigation potential : Nil ha  
 1.5.3 Source of irrigation  
     1. Rivers : NA nos  
     2. Tanks : NA nos  
     3. Open wells : NA nos  
     4. Bore wells : NA nos  
     5. Any other sources  
         River lift irrigation : 1266 nos.  
         Canal : 2629 nos.

### 1.6 Land use and Cropping intensity

- 1.6.1 Gross cropped area : 28241.46 ha  
 1.6.2 Net Area sown : 21236.40 ha  
 1.6.3 Fallow lands : 13.60 ha  
 1.6.4 Cultivable waste lands : 235 ha  
 1.6.5 Forest cover : NA  
 1.6.6 Barren lands : NA  
 1.6.7 Cropping intensity : 136.7

### 1.7 Major Crops

- 1.7.1 Principal crops, area, production and productivity (Please don't change the units specified below)

Sl. No	Principal Crops	Area (in ha)	Production (in tones) (1ton=1000kg)	Productivity (kg/ha)
1.	Pre-kharif rice	5190	12870	2480
2.	Main kharif rice	33720	122970	3860
3.	Maize	740	1280	1730
4.	Kharif pulses	270	350	1300
5.	Rabi pulses	2590	3170	770

6.	Kharif oilseeds	1070	920	860
7.	Rabi oilseeds	2280	1350	590
8.	Sugarcane	790	43390	54920
9.	Potato	890	7100	7980
10.	Pineapple	195	1365	1430
11.	Banana	190	1330	1430
12.	Cabbage	180	2232	12400
13.	Chilly	1000	4000	4000

- 1.7.2 Crop rotations followed : 1. rice-fish culture  
2. rice-mustard-potato  
3. rice-winter vegetables
- 1.7.3 Crop sequences followed : 1. rice-rice-mustard-maize  
2. maize-pea-bean  
3. rice-potato-rice
- 1.7.4 Inter-cropping done, if any : 1. maize:potato  
2. pineapple :groundnut :  
3. maize : soybean
- 1.7.5 Mixed cropping done, if any : 1. Pea+mustard  
2. Maize+bean  
3. Tree bean(*Perkia roxburghii*) +pineapple
- 1.7.6 Catch crops grown, if any : 1. sugarcane  
2. potato

### 1.8 Socio-economic Characteristics, Land Holding Pattern

- 1.8.1 Average size of land holdings : 1 ha
- 1.8.2 Average fragmentation intensity : NA nos (ie a holding gets fragmented to this many nos)
- 1.8.3 Existing land tenure system(s) : Wholly owned ,wholly leased in, partly owned and partly leased, wholly otherwise operated
- 1.8.4 Source(s) of finance for farming : Rank 1. Local money lender  
Rank 2. Private banks  
Rank 3. govt./nationalized banks
- 1.8.5 Main source of income for farmers : Rank 1.Farming  
Rank 2. Daily wage earning  
Rank 3. Weaving
- 1.8.6 Commercial commodities produced : Rank 1. Rice  
Rank 2. Vegetables  
Rank 3. Handloom products

## 1.9 Farm Machinery and Implements available in your district

1.9.1	Number of tractors	: 249 nos.
1.9.2	Number of power tillers	: 510 nos.
1.9.3	Number of carts	: 2368 nos.
1.9.4	Types of implements-Ploughs	: 3962 nos.
	Cultivators	: 4042 nos.
	Discs	: Nil nos.
	Harrows	: 494 nos.
	Others Leveler	: 4292 nos.
1.9.5	Pumps (Oil and electrical)	: 685 & 747 nos.
1.9.6	Harvesters and Threshers	: Nil & Nil nos.
1.9.7	Sprayers and Dusters	: 2423 nos.

## 1.10 Livestock

1.10.1	Cattle	: 54139 nos.
1.10.2	Buffaloes	: 2961 nos.
1.10.3	Sheep and goats	: 1114 & 2578 nos.
1.10.4	Pigs	: 83940 nos.
1.10.5	Poultry and ducks	: 576172 & 467355 nos.
1.10.6	Production of milk	: 10400 lit.
1.10.7	Production of meat	: 115887 ton
1.10.8	Production of eggs	: 188590 lakhs.
1.10.9	Production of wool	: NIL

## 1.11 Livestock holding patterns

### 1.11.1 Livestock holding pattern for big farmers

Sl. No	Animal/ bird	Average nos. possessed	Rank according to nos. possessed
1.	NA	NA	NA
2.	NA	NA	NA
3.	NA	NA	NA
4.	NA	NA	NA
5.	NA	NA	NA

### 1.11.2 Livestock holding pattern for small farmers

Sl. No	Animal/ bird	Average nos. possessed	Rank according to nos. possessed
1.	NA	NA	NA

2.	NA	NA	NA
3.	NA	NA	NA
4.	NA	NA	NA
5.	NA	NA	NA

#### 1.11.3 Livestock holding pattern for marginal farmers

Sl. No	Animal/ bird	Average nos. possessed	Rank according to nos. possessed
1.	NA	NA	NA
2.	NA	NA	NA
3.	NA	NA	NA
4.	NA	NA	NA
5.	NA	NA	NA

#### 1.11.4 Livestock holding pattern for agricultural laborers

Sl. No	Animal/ bird	Average nos. possessed	Rank according to nos. possessed
1.	NA	NA	NA
2.	NA	NA	NA
3.	NA	NA	NA
4.	NA	NA	NA
5.	NA	NA	NA

Average yields of various animals and bird in your district.

Sl. No	Animal/bird	Average yield (Specify Units)
1.	Cross bred cow milk	7923 lit//day
2.	Indigenous cow milk	1437 lit//day
3.	Buffalo milk	3342 lit//day
4.	Fowl and ducks eggs	51668.49 nos./day
5.		

### 1.12 Research Resources

- 1.12.1 Number of research stations : 4 nos  
 1.12.2 Number of ICAR institutes/substations : 1 nos  
 1.12.3 Number of state seed farms : Nil  
 1.12.4 Number of private seed farms : Nil

### 1.13 Agricultural Marketing Status and Constraints

#### 1.13.1 Ways of disposal of farm produce and by-products

Sl. No	Major Farm produce	Marketing channel	Bye product (if any)	Marketing channel
1.	Rice	Local	Straw	Local
2.	Maize	Local	Stem	Local
3.	Potato	Local	-	-
4.	Sugarcane	Local	-	-
5.	Vegetables	Local & neighboring satiates	-	-
6.	Oilseed & pulses	Local	-	-

#### 1.13.2 Market types – whole sale and retail markets in your district

a. Wholesale markets : 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

b. Retail markets : 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

#### 1.13.3 Major modes of transport to market:

1. Trucks

2. Bus

3. Taxi

#### 1.13.4 Available/commonly used conveyance facilities (roads/waterways) to market :

1. Roads

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

### 1.14 Agro-climatic Zones (map to be collected and added with)

#### 1.14.1 Various zones in your state :

1. Sub Himalayan Humid Region Zone III

2. Sub- temperate

3. Sub-Subtropical

#### 1.14.2 List the various zones in your district :

1. Sub- temperate

2. Sub-Subtropical

## Part - II

### 2. Farming systems in the district

Agri. and Horti. based farming system

#### 2.1 Basis/Criteria for identifying farming systems:

Each farming system must be homogeneous, in general for the following.

1. Soils - Black soil, alluvial soil
2. Rainfall- 119.2 mm/yr.
3. Physiography- Midland(40%) and low land (60%)
4. Altitude- 775 m
5. Irrigation pattern- canal and rainfed
6. Temperature- Max. 29.4 Min. 6.1

#### 2.2 Summary of farming Systems

Based on the criteria listed under the above items, classify the agro-ecological situation into homogeneous farming situations and thus may be furnished in a table as shown below.

Farming system	Soils	Rainfall	Altitude	Principal crops/breeds	Important features	Location (area), extent of area in ha.
1. Agriculture based system	Alluvial	119.2m/yr.	775 m	Rice, potato, pea, rape seed mustard , maize, black gram,	Medium soil fertility ,medium acidity and pain valley land	NA
2. Horticulture based system	Alluvial	119.2m/yr.	775 m	Rice, Pea, cole crops, beans, solanecious crops, alocasia, colocasia, alium	Medium soil fertility ,medium acidity and pain valley land	NA
3. Agriculture based system	Red lateritic soil	119.2m/yr.	800 m	Groundnut, soybean, rice bean, maize, red gram, black gram	Medium soil fertility ,medium acidity and foot hill with gentle slope	NA
4. Horticulture based	Red lateritic soil	119.2m/yr.	800 m	cucurbits, pineapple, cole crops, tuber crops, turmeric, zinger etc	-do-	NA
5. Fish based	Pit soil	119.2m/yr.	775 m	Rice, fish, <i>makhana</i>	Medium soil fertility ,medium acidity and plain valley land at the periphery of loktak lake	

#### 2.3 Agricultural characteristics of each farming System

(Classify and arrange the data collected in Part-I into Farming system wise under the following headings given below. The pattern followed under part – I can be repeated here for compilation)

2.3.1 Boundaries of the FS -

2.3.2 Soils under the FS – Alluvial, Pit soil and Red lateritic soil

- 2.3.3 Climates under the FS- Sub-temperate and Sub-tropical
- 2.3.4 Physiography under the FS-
- 2.3.5 Irrigation facilities under the FS- Cananal and raifed
- 2.3.6 Major crops and cropping intensity under the FS- Rice, rapeseed mustard, vegetable and pea. (136.7%)
- 2.3.7 Major cropping systems under the FS- Rice based and vegetable based
- 2.3.8 Land use pattern under the FS-
- 2.3.9 Land holding pattern under the FS- Wholly leased in, partly owned and partly leased, wholly otherwise operated
- 2.3.10 Populations and socio-economic characteristics under the FS
- 2.3.11 Adoption pattern for each crop/breed/other technology under the FS
- 2.3.12 General production constraints for each crop under the FS- Lack of irrigation facility

**In the same fashion the required information may be furnished for all farming systems. After identifying constraints/gaps (technology/extension) under each farming system, the priorities have to be delineated and the development strategy in form of action plan has to be prepared and presented below.**

## **2.4 Research Priorities and Strategy**

### 2.4.1 Research gaps identified for each farming system and crop

Sl. No	Farming system	Crops under the FS	Research gaps identified
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	Need for quality HYV seeds and agro-techniques.
2.	Horticulture based system	Cole crops, cucurbits, solanaceous crops	Need for quality HYV seeds and integrated pest and disease management
3.	Fish based	Rice, Makhana and fishery	Integrated farming, suitable rice variety for the specific farming system.

### 2.4.2 Research priorities finalized for each farming system and crop

Sl. No	Farming system	Crops under the FS	Research priorities finalised
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	HYV of rice, oil seed and pulses and HQPM maize
2.	Horticulture based system	Cole crops, cucurbits, solanaceous crops	HYV seeds and integrated pest and disease management
3.	Fish based	Rice, Makhana and fishery	Integrated farming, suitable rice variety for the specific farming system.

### 2.4.3 Research strategy proposed for each farming system and crop

Sl. No	Farming system	Crops under the FS	Research strategy proposed
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	OFT and feed back to ICAR for research
2.	Horticulture based system	Cole crops, cucurbits, solanaceous crops	OFT and feed back to ICAR for research
3.	Fish based	Rice, Makhana and fishery	OFT and feed back to ICAR for research

## 2.5 Development Strategy

### 2.5.1 Extension gaps for each farming system and crop

Sl. No	Farming system	Crops under the FS	Extension gaps identified
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	Lack of awareness about HYV and scientific agri practices
2.	Horticulture based system	Cole corps, cucurbits, solanaceous crops	Lack of awareness about HYV and scientific agri practices
3.	Fish based	Rice, Makhana and fishery	Lack of awareness about HYV and scientific agri practices

### 2.5.2 Extension priorities finalized for each farming system and crop

Sl. No	Farming system	Crops under the FS	Extension priorities finalized
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	Training, FLD and OFT
2.	Horticulture based system	Cole corps, cucurbits, solanaceous crops	Training, FLD and OFT
3.	Fish based	Rice, Makhana and fishery	Training, FLD and OFT

### 2.5.3 Extension strategy for each farming system and crop

Sl. No	Farming system	Crops under the FS	Extension strategy proposed
1.	Agriculture based system	Rice, maize, soybean, field pea, rape seed mustard.	Training, FLD and OFT
2.	Horticulture based system	Cole corps, cucurbits, solanaceous crops	Training, FLD and OFT
3.	Fish based	Rice, Makhana and fishery	Training, FLD and OFT

Kindly mail the filled in questionnaires to [icar\\_zcu3@yahoo.co.in](mailto:icar_zcu3@yahoo.co.in) giving subject as FSRE.

THANK YOU