



# Dynamic Concept of Coastal Agricultural Landuse and Agricultural Resources - A Case study at Egra Block-I and Egra Block-II, Purba Medinipur, WB, India

Chandan Karan<sup>1</sup>, Shashi Bhushan<sup>2</sup> and Manojit Mondal<sup>1</sup>

<sup>1</sup>Geography Department, Ranchi University, Ranchi, Jharkhand, INDIA

<sup>2</sup>Geography Department, K.O. College, Ranchi, Jharkhand, INDIA

Available online at: [www.isca.in](http://www.isca.in)

Received 18<sup>th</sup> February 2015, revised 21<sup>th</sup> April 2015, accepted 8<sup>th</sup> May 2015

## Abstract

Resource is the most dynamic in nature. Geographical paradoxes of nature and human needs base resource function ability are the most significant parameter for resource dynamic. In this concept agricultural resource are the important and demandable primary economic activity for economic development. The primary economic activity base agricultural resource and agricultural land use are continuous dynamic through time by time. Some physical parameter and socio-economic parameter are determine for dynamic change of agricultural resource and agricultural land use. In study area, Egra block-I, Egra block-II of Purba Medinipur (W.B.) as a coastal area where the agriculture and agricultural land use practice rapidly change day by day. Mainly food crops field are highly converted and dynamic change in to commercial crops field. Some geomorphic determinism and socio economic determinism are the main force full factor for this resource dynamic change.

**Keywords:** Resources, Dynamic concept, Agriculture resources, Agricultural land use, Geomorphic Determinism, Socio-economic change, Resource dynamic.

## Introduction

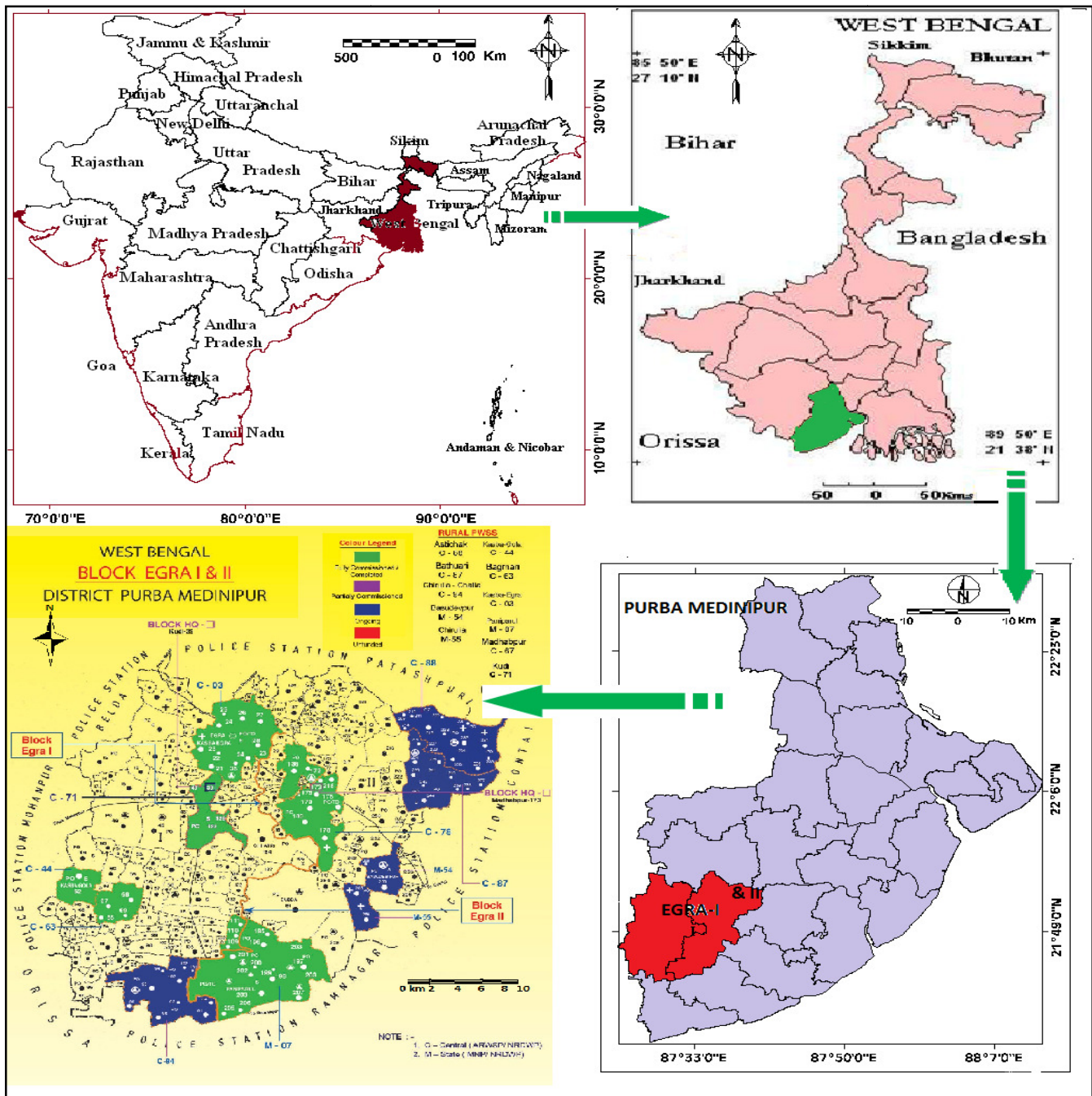
Resource creation process is dynamic in nature. Resource based land use are the most highly dynamic nature. Human needs base resource functionality and physical parameter base resource possibilities are the most significant parameter for resource dynamics in coastal area<sup>1</sup>. Three most important factors are nature, culture and man interaction for resource creating and dynamic through day by day. Paradoxes of nature and geographical distribution of natural endowments are the related with geomorphic determinism on a particular area. Other side man-culture base resource production, use and management are the most dominant parameter for resource creation, also resource dynamic. In this concept agricultural resource is the important and demandable primary economic activity<sup>2</sup>. The primary economic activity base agricultural resource and agricultural land use are continuous dynamic in study area. Egra block-I, Egra block-II of Purba Medinipur (W.B.) as a coastal area where the agriculture and agricultural land use practice rapidly change day by day. Mainly food crops are highly converted and dynamic change into commercial crops.

**The study area:** Egra block I and Egra block II of Purba Medinipur, W.B are located on latitudinal extension 21°30'25"N-21°45'N and longitudinal extension 86°45'E-87°45'E. Geomorphologically this area located in a part of 'Digha -Kanthi' coastal plain, that which lower part of coastal tract in West Bengal. On the other hand this study area situated

under the 'Dubda basin' at lower part of Rasulpur river. Coastal alluvial and older alluvial plain covered with all over the study area during the Quaternary period of geological time scale, Geomorphic process base sandy, and sandy-loamy soil are formed due to long term of weathering, erosion and depositional process on during time. Egra block I consistence of 8 rural gram-pachayats and Egra block II consistence of 8 rural gram-pachayats. Total geographical study area is 40106.1sq Hecter. (Figure-1).

**Problems to be investigated:** i. Geomorphic terrain base flood effected problem and its impact on agricultural land use and agricultural resource. ii. Changing land use pattern due to geomorphic pedological aspect on study area. iii. Food crops base agricultural field rapidly change into commercial crops field on study area. iv. Socio economic changes on study area.

**Objective of study area:** i. To study the geomorphology and geomorphic aspect of study area. ii. To study the land use pattern of study area. iii. To study the agricultural resource production on study area. iv. To study the geomorphic determinism of agricultural practice on study area. v. To study the dynamic changing pattern of agricultural resource production for development. vi. To the study dynamic change of agricultural land use base problem. vii. To study the planning aspect on study area.



**Figure-1**  
 Location of the Study area (Egra block-I, Egra block-II)

**Methodology**

In the present research work including with geomorphic analysis. Geomorphic terrain, slope base drainage alignment, soil structural-textural characteristics e.t.c. analysed into qualitative and quantitative approach. Literature survey, census survey, climatic data study topographical map study and administrative map-data study along with pre field work. Field work related with intensive field survey along with physical and socio-economic parameter base land use survey and perception

survey on study area. Post field work related with geographic techniques base measurement and analysis through qualitative and quantitative approach.

**Geomorphology and Geomorphic Aspect On Study Area:** Geomorphologic ally the study area cover with Purba Medinipur coastal tract. Coastal alluvial and older alluvial base sandy and sandy loamy soil are occupied this area. 75% area are cover and determine by 'Dubda basin'. Surface elevation refer the 0m to 10m above the mean sea level and Gentle slope (>10°)

formation is the most important parameter of this area. Other hand seasonal flooding are occupied this region. So Egra Block-I and Block-II geographical area's terrain morphology is determine by coastal morphology and coastal base seasonal flooding. Agriculture are the most common economic activity of this area's population, but this agriculture base resource and agricultural land use are mostly seasonal determine .so man have change his agricultural practice, that effect agricultural land and agriculture resource dynamic<sup>3,4</sup>.

**Resource Base Agriculture And Land Use Study:** Egra block-I and block-II are the coastal base resource producing area, where coastal alluvial and older alluvial land occupied by sandy ,sandy loamy and loamy soil cover. Total geographic region are mostly cover with agriculture related economic activity. Food crop, commercial crop , plantation crop, horticultural crop and water base aqua culture are placed of this region (Figure 2). But recent trends of agriculture base resource are dynamic change of food crop to commercial crop. Because geographic terrain,

seasonal flood and soil textural composition are not favorable for food crop (rice) agriculture.<sup>5</sup> So habitat people are rapidly change (dynamic change) of his agricultural practice (table-1 and table-2) .This effect food crop field are dynamic change to commercial crop (Groundnut, Mustard oil seeds, Til e.t.c.)

**Dynamic Change of Agricultural Resource Production:** Recent and previous statistics of agricultural resource are shown that year and hector wise food crop production are reduced but commercial food crop production are increase<sup>6</sup>. So rapidly changed of agricultural resource practice and production. It say that a farmer are not satisfied of food crop (rice) cultivation than the commercial crop (Groundnut, Mustered oil seeds, Till etc.) cultivation (Table-4). As a background some geomorphic determinisum, seasonal flood, Not favorable soil textural composition of the study area. Push factor (Reduction of food crop cultivation) and pull factor (increases of commercial crop cultivation) are showing bellow (Table-3)<sup>7,8</sup>.

**Table-1**  
**General land use and cropping pattern in study area-(Block-I) 2011-12**

JL NO.	Gram Panchayat/ Municipality	Geographical Area in Hector	Net Cropped area(hector)	Agricultural resource and Land Situation (area in hector)			
				Plantation and Horticulture	Commercial crop area	Food crop area	Aqua culture and others
1	Barida	2856.8	2273.2	223.2	1676.0	302	72
2	Kosba Egra	784.0	477.6	0.6	347.0	125.0	25
3	Chhatri	2611.6	2206.0	66.0	487.0	1332.5	320.5
4	Jerthan	2677.6	1939.6	66.0	1642.2	189.6	41.2
5	Panchrole	2447.2	1955.2	110.2	1215.0	399.0	231
6	Sahara	2666.8	1860.0	63.0	1265.0	350.3	181.7
7	Rishi bankim chandra	2652.4	2085.2	80.2	1301.0	382.9	321.1
8	Jumki	2871.2	2293.2	37.2	1041.0	1054	161
9	Egra Municipality	1911.6	1160.4	3.4	921.8	205.9	29.3

Source: Office of Asst. Director of Agriculture, Egra Block-I, Purba medinipur.

**Table -2**  
**General land use and cropping pattern in study area-(Block-II) 2011-12**

SL NO	Name of G.P	Geographical area(hector)	Net crop area(hector)	Agricultural resource and Land Situation (area in hector)			
				Plantation and Horticulture	Commercial crop area	Food crop area	Aqua culture and others
1	Deshbondhu	2354.44	2215.67	319.5	831.6	939.7	124.87
2	Bathuary	2964	2258.71	271.6	753.7	1012.7	220.7
3	Vivekananda	2361.69	2143.90	166.5	910.5	996.5	70.4
4	Manjushree	2453.25	2317.22	115.0	1074.7	994.5	133.02
5	Paniparul	2579.75	2361.59	310.2	918.9	1075.7	56.79
6	Dubda	3129.34	2680.76	313.7	826.8	996.5	543.76
7	Sarbodaya	1356.00	1242.63	80.2	449.7	632.7	80.03
8	Basudev pur	1428.43	1398.84	91.8	539.5	710.7	56.84

Source: Office of Asst. Director of Agriculture, Egra Block-II, Purba medinipur.

**Push factor (Reduction of food crop cultivation):** Seasonal flood, Sandy soil coverage, Low rate of production, High rate of labour involved, Labour cost high, Decreasing Marketing rate of Rice paddy, Problem of mechanization and equipment, Not accessibility of road for crop plants carries, Increasing of transport cost (heavy materials), Not support of agricultural lone, Insurance store rooms e.t.c, Extensive time involved, lake of labour input, Hige cost of Fertilizer, seeds and pesticide. E.t.c.

and loamy soil coverage, High rate of production, Few rate of labour involved, Favorable condition for short term of mechanization and equipment, Only collected grain carry, Not heavy materials, Short time involved crop cultivation, Small level use of fertilizer, seeds and pesticide, Favorable for income level, Market price rate is high, No needed for storage of crops, Economic benefited than the food crops, Directly and indirectly maximum no. of employment person on commercial crop, Low level risk of commercial crop than the food crops cultivation<sup>9,10</sup>.

**Pull factors (increases of commercial crop cultivation):**  
 Favorable season of winter for commercial cultivation, Sandy

**Table-3**  
**Comparative study of Food crop cultivation (Rice paddy) and Commercial crop cultivation(Groundnut):**

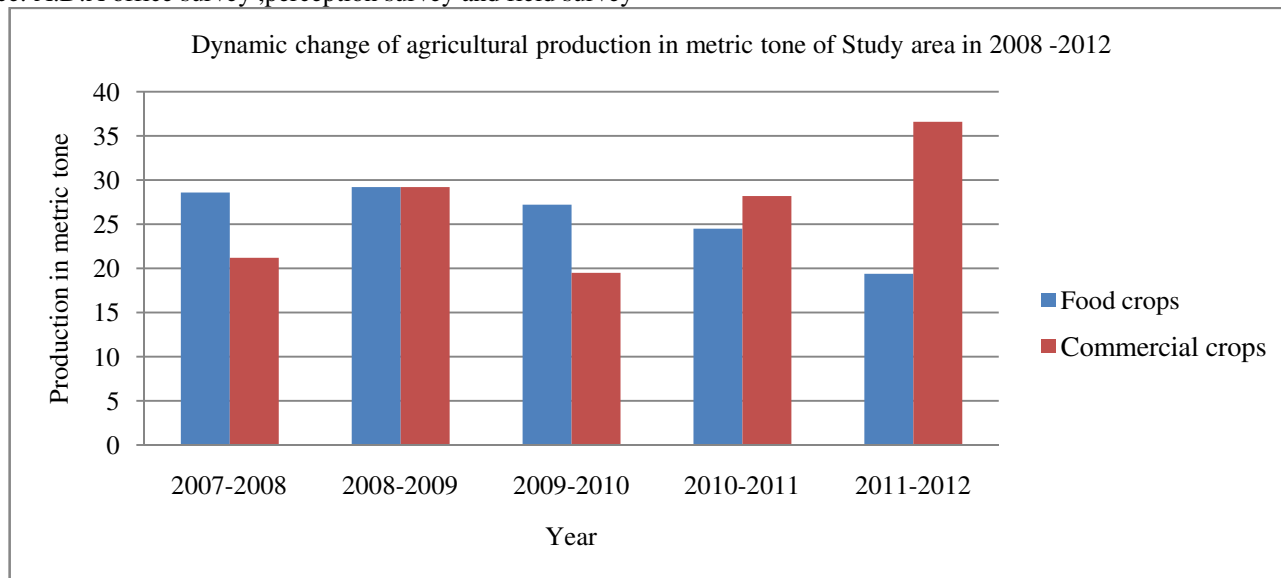
Food crop cultivation(Rice paddy) in 1Acre			Commercial crop cultivation(Groundnut) in 1Acre		
Cultivated related expenditure (in 1 Acer)	Amount	Rupees	Cultivated related expenditure (in 1 Acer)	Amount	Rupees
Seeds of rice paddy	35kg	1200	Seeds of Ground nut paddy	55kg	5500
1st Drilling process for transplantation		100	Drilling process		1200
Transplantation process		250	Fertilizer(N.P.K)	50kg	1100
Fertilizer(N.P.K)	11kg	250	Micro nutrient	5kg	180
pesticide(Saff,Upl comp.)		80	Fertilizer(patus)	23kg	500
2nd Drilling process for plantation		900	Herbicide (Pendimithile)	1.5liter	600
Fertilizer(N.P.K) apply on Drilling time	30 kg	600	1st Spray-Carbandisum and Herbicide	250g 300ml	140 80
Herbicide (Pendimithile)	500 ml	100			
Fertilizer(N.P.K) apply for plant growth	20kg	400	Fertilizer(N.P.K) apply for plant growth	30kg	700
1st Spray-Carbandisum and Herbicide	300 g 300ml	150 150	2nd Spray-Carbandisumand Herbicide	250g 300ml	140 150
2nd Spray-Hexagonan and Herbicide	300ml 300g	150 150	Micro nutrient	5kg	180
2nd Fertilizer(N.P.K) apply for plant growth	14kg	300	3rd Spray-Boron and Hexaconazole	30g 300ml	70 100
3rd Spray(Tricyclolijol-Beam)	150g	180	4th Spray-Assataf, Carbandisum and Hexaconazole	300g 300g 300g	150 140 130
4th Spray(Acifate-Conifidor)	100ml	400	Thaimate	8kg	450
Labour	45person	9000	Labour	40parson	8000
Water		6000	Water		4000
TOTAL		20360	TOTAL		23510
PRODUCTION andMARKET VALUE(1000/1Quental)	25- 28Quental	25000- 28000	Production and Market Value (3500/1Quental)	20- 25Quental	70000- 87500
PROFIT		4640-7640	PROFIT		45000- 50000

Source: A.D.A office survey, perception survey and field survey.

**Table-4**  
**Status of Dynamic Change of Agricultural Resource Production 2008-2012:**

Year	Study area	Net cultivated area in Hector	Agricultural landuse and Agricultural Resource Production(in metric tons)				
			Food crops	Commercial crops	Plantation crops	Horticultural product	Aquaculture and other product
2007-2008	Egra block-I and block-II	33140.42	28.60	21.20	1.60	142	1.20
2008-2009		32900.43	29.20	29.20	1.20	1.60	1
2009-2010		32859.76	27.20	19.50	1.92	1.82	0.25
2010-2011		32861.72	24.50	28.20	2.60	1.22	0.50
2011-2012		32854.36	19.40	36.60	1.80	1.60	0.62

Source: A.D.A office survey ,perception survey and field survey



**Figure-2**

Status of Dynamic Change of Agricultural Resource Production in 2008-2012 at study area Egra block-II and block-II

**Table-5**  
**Flood as a geomorphic determinism on agricultural land use base resource dynamic change:**

Year	Net cultivated area in Hector	Agricultural resource and land use effected area in percentage		
		Boro cultivation(March-June)	Aush cultivation(July-Oct.)	Aman cultivation (Nov. -Feb.)
2007-2008	33140.42	-	40-50	50-60
2008-2009	32900.43	-	20-30	-
2009-2010	32859.76	5-10	20-25	20-25
2010-2011	32861.72	10-15	20-25	20-30
2011-2012	32854.36	-	30-40	10-20

Source: District data base survey, perception survey and field survey

**Table-6**  
**Seasonal Rainfall data Shown on study area**

Rain fall (Season)	Normal rain fall (mm)
WS monsoon (June-Sep)	1238.6
NE monsoon (Oct- Dec)	288.2
Winter (Jan-March)	73.9
Summer (April-May)	145.9

Source: Official data base west Bengal Agriculture Contingency Plan for District survey, perception survey and field survey

**Table-7**  
**Pedological Determinism on Agricultural Land use Base Resource Dynamic Change**

Study area	Soil Type(textural composition)			Pore space	Water Holding Capacity	Favorable for rice cultivated area	Favorable for Ground nut Cultivated area
	Sandy soil	Sandy loamy soil	Loamy soil				
Egra block - I	20%-30%	40%-50%	30%-40%	50%	Low to Medium	30%-40%	60%-80%
Egra block - II	30%-40%	40%-50%	20%-30%	40%	Low to Medium	20%-30%	50%-60%

Source: perception survey and field survey and Departmental laboratory study.

Dynamic Change Related Impact Base problem: Some physical and Socio-economical determinism and possibilities are the vital key of dynamic nature of coastal agricultural resource. Some important negative impact create due to dynamic change related problem, these are- 1. Food crop crisis 2. Land use, agricultural practice and socio cultural habit change 3. Death for snake attack 4. Monkey effect problem.

### Conclusion

From the above analysis is clear that the dynamic change of agricultural land use and agricultural resource. So various type of problem arise of this study area, that which shown above points. Firstly, some recommendation for food crop crisis. It is large scale problem for primary needs as a food. This problem recommended by the following point of planning and suggestion

1. To do the seasonal base cultivation work food crop and commercial crop cultivation through the modern techniques apply. 2. High yielding crop cultivation apply. 3. March-June month avoid base food crop cultivation apply. 4. Protection of flooding effect on agricultural activity. 5. Management program for flood problem on agricultural land use and agricultural resource. Secondly, as a problem of socio-cultural habit changes. So some recommendation for social stability, that is – To do the motivated of cultivators (farmer) for various type of food crop related commercial activity on crop relax season time, as an example of 1. Commercially rice to rice paddy processing. 2. Rice paddy to fry-rice process. 3. Rice paddy to flattened and friend rice processing. Thirdly, the problem is snake attack and death of human society. As a commercial crop field is highly covered with jungle environment, so various type of poisonous snake are habited in this field and effect on human society. So some recommendation for this effect- 1. Strictly consciousness 2. Protective dress use on field 3. Highly techniques apply on commercial crop field. 4. Protective medicine supply for diagnosis. Forth, the some recommendation for Monkey effect

problem of this study area, these are- 1. Strictly consciousness and controlling act for monkey effect. 2. Crop rotation and crop cultivation change year by year (seasonal). Lastly, all over convince and inform of all agriculture engaged people for the equal approach apply on food crop cultivation and commercial crop cultivation.

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