GEOGRAPHY
By
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2014

Agriculture Geography

Part 9

lower societal category

3RD STEP OF HUMAN GEOGRAPHY :=

I. Agriculture Geography

ECONOMIC GEOGRAPHY

P1 : Whittelsey's, agri-typologies, agri-regions

P2 : → Agricultural Regions of India
→ Agro-Climatic Regions of India

→ National Food Security Mission → Rice, Wheat, Pulses

→ Green Revolution :

- Generation I
  - → Agri Infra.
  - → Agri Productivity
  - → Cropping Intensity
- Rainbow Revolution
  - White Revolution
  - Poultry
  - Blue Rev'n

→ RKVY : Rashtriya Krishi Vikas Yojana

- Apiculture
- Seri-Culture

→ Evergreen Revolution (Social Forestary)

→ Von Thunen's Agricultural Loc'n Model (1826)

Agriculture : Paper 1 → factual
Paper 2 → Extensive

Intensive Subsistence With Paddy : World view

Whittelsey's Classification, Agricultural Typology & Agricultural Regions

The reproductive industry agriculture represents the oldest economic activity. Human population have been engaged in this activity includes cultivation of crops, rearing of animals, aqua-culture & forestary as its constituents. This sector reveals both diverse & dynamic characteristics where the diversity is regulated both by prevailing natural conditions (soil climate relief) as well as human factors i.e. infrastructural inputs of agriculture. For the identification of global agricultural types requires generalization have been best attempted by German scholar Whittlesey to outline the agricultural typologies way back in 1936 in the text entitled "Agricultural Regions of World", he outlined 13 agricultural typologies of world.

(i) Nomadic Herding
(ii) Livestock Ranching
(iii) Shifting Agriculture
(iv) Sedentary Agriculture
(v) Intensive Subsistence with Paddy
(vi) Intensive subsistence without paddy
(vii) Mixed subsistence

} Developing Tropical Typologies

(viii) Extensive Commercial Grain Farming
(ix) Extensive Commercial Mixed Farming
(x) Commercial Dairy Farming

} Developed Temperate Typologies

(xi) Mediterranean Agriculture
(xii) Horticulture with truck farming
(xiii) Plantation Agriculture

} Specialised Agriculture

Date : 22/04/2014

Map.

⇒ Madhya Pradesh, Chhattisgarh, Odisha:

Hirakud Res.
Kurung Res.
Mandira Res.
Upper kolab Res.
* Macchhakund Res.
Jalaput Res.
Salaput Res.
* Balimela Res.

Lake Kollesu
Nizam Sagar Res. (R. Manjra)
Lake Beale
L. Andhra
L. Mulshi
L. Bhatghar
Shivaji Sagar
Nagarjuna Res.

L. Pulicati (Lagoon Lak
Bhadra Res.
Linganamakki Res. (R. Saravati)
Vanivilasa Sagar Res.

Kubbanahalli Res.

Charmaraja Sagar Res

Shimsha Res.

Sugu Res.

Stanley Res.

Bhavani Sagar Res.

L. Periyar

L. Vembanad

L. Asthamudi Kayal (Backwater lakes)

LECTURE : 62

Date 23/04/2014

Agricultural regionalisation = Agri. typology

(A) TROPICAL DEVELOPING TYPOLOGY :=

The tropical latitude largely represent the developing countries of the world which in combination to the larger population size and excessive dependency on agriculture sector reflects lesser per capita land holding and therefore prominently combines – intensive subsistence, manual labour, oriented agriculture. In this category absolutely livestock dependent agriculture types include – nomadic herding and livestock ranching.

(i) Nomadic Herding

Nomadic herding depicting primitive typology primarily involves dependency of human population on livestock and dependency of livestock on natural pasture. Being primitive-most typology, it correlates to least exploitative nature and thus is referred to be ecological type of agriculture. Prominent location of nomadic herding includes tropical savannah where

MASEI, the cattle herder; tropical desert where BEDOWIN, the camel herder; Sub-tropical desert where KAZAL MONGOLS, the horse herders; & sub-polar region where SOMAYEDS, the reindeer herder represent the examples.

(ii) Livestock Ranching

The livestock ranching in comparision represent the agricultural typology that involves rearing of animals. In this agricultural typology, cultivation of fodder crops makes it slightly extractive, thus near ecological type of agriculture. Well-developed in tropical countries, livestock ranching involves both subsistence and commercial orientation. In most of the African Savannah specifically the country like Cameroon, Central African Republic, milch cattle rearing depicts examples of subsistence livestock ranching. More elaborate sub-category, however, includes beef-cattle rearing in Alfalfa grass (CAMPOS, BRAZIL), Llanos (Venezuela), Okawambo (BOTSWANA);

milch cattle rearing in Carpentaria Plains (AUSTRALIA), sheep rearing Nullarbor Plain (AUSTRALIA) and Patagonia Plateau (ARGENTINA) represent commercial livestock ranching with wide range of animal produce.

Near Ecology Vs Ecology

Near Ecology → Extraction of something (Minimal)

Ecology → Extraction non.

Dairy Farming Vs Ranching

Shifting Vs Sedentary Agriculture

Shifting	Sedentary Agriculture
· Rotate field	· Stable Agri.
· Ecologically not sound	· Rotate Crops
	· Ecologically sound.

(iii) SHIFTING AGRICULTURE :=

It is a primitive crop culture involving the cultivation of food crops like rice, maize — completely deprived of livestock. This typology practiced by 4th world communities in the wetter tropics represent non-ecological type. In this typology elimination of standing natural vegetation (SLASH AND BURN AGRICULTURE) and rotation of agricultural fields correlates to

exponential exploitation of natural assets.

(iv) SEDENTARY AGRICULTURE :=

Also called primary stable agriculture, it involves rotation of crops rather than fields. This typology represent near ecological type involving low production / productivity, large extent of fallow land, maximum 2 crops cultivated per annum and utilisation of crude agriculture implements. Confined to the wetter tropics, it also primarily correlates to rice and maize like crops with livestock making primary constituent of agriculture field availability of biotic manure, further multiplies ecological dimension of sedentary agriculture.

(v & vi) INTENSIVE SUBSISTENCE CULTURE :

The intensive subsistence culture represents the developed, thus, non-ecological agriculture typology. It commonly incorporates small land holding variety of crop cultivation, minimum fallow land however with the distinction of

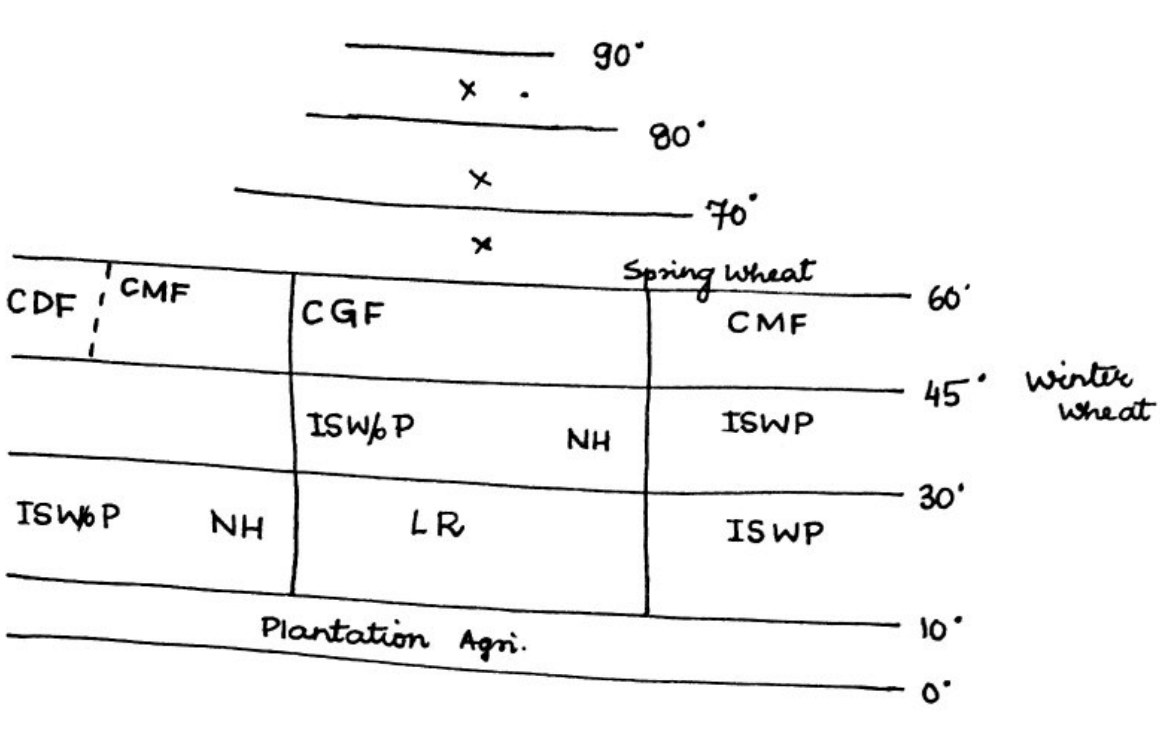
primitive and non-primitive type. As it is in non-primitive type that intensive use of agricultural infrastructure inputs (fertilizers, irrigation) significantly multiplies production and productivity level. Collectively, the intensive subsistence typology in terms of location thus climate is sub-categorised as with paddy culture confined in wetter margins of tropical and sub-tropical region and without paddy culture (winter wheat) in drier west margin of tropics and continental interior of sub-tropical region.

Primitive does not have capacity to retain fertility of soil.

(vii) MIXED SUBSISTENCE :=

Mixed subsistence farming is the specified typology where absolute similar economic status is provided to crop and livestock in agriculture. In the tropical latitude, however, characteristics of agriculture either represent crop dominance

or livestock dominance making mixed subsistence evolving typology wherein country like Sudan, India, China are projected to be potential examples.



NH = Nomadic Herding

ISWP = Intensive Subsistence with Paddy

ISW/oP = Intensive Subsistence without paddy

LR = Livestock Ranching

CMF = Comm. Mixed Farming

CGF = Comm. Grain Farming

CDF = Comm. Dairy Farming

B. TEMPERATE DEVELOPED TYPOLOGY :

Temperate latitude represent developed countries of the world with lesser population load and lesser share of farm population. It is this combination that facilitate extensive commercial and mechanised agricultural typology. Within this category extensive commercial grain farming, mixed farming and dairy farming are included.

(i) The Extensive Commercial Grain Farming : It correlates to the cultivation of 2nd prominent food crop of the world wheat. Originally this typology was extensive in entire temperate latitude revealing the benefit of fertile soil and favourable climate. Presently it has been shrinked to continental interior which correlates to naturally most fertile soil with best possible utility of grain farming. It is with this typology that the bread basket of the world (North American Prairies) and wheat-triangle of the world (Eurasian Steppe) are included. Wheat as the food crop of the world involves China & India

as prominent producers justifying its cultivation as intensive commercial typology as well. Along with it, it applies the distinction in the two prominent types of wheat cultivated in the world called WINTER WHEAT (LOWER LATITUDE) and SPRING WHEAT (HIGHER LATITUDE).

(ii). The Extensive Commercial Mixed Farming :=

It represent the most developed agricultural typology from economic and ecological perspective, availing equal weightage to crop and livestock. This typology involves economic benefit as labour requirement very well spread throughout the year, waste of one sector utilised as raw material of other along with projecting farmer interest by minimising the risk of negative economic effect due to poor price or outbreak of diseases. These many fold benefit makes this typology registering major extension in the temperate latitude causing shrinkage of commercial grain farming only to the continental interior.

(iii). The Commercial Dairy Farming :

It forms the agricultural typology which is largely intensive commercial with both mechanised and manual labour orientation. This typology involves exclusive rearing of milch animals for the production of milk and dairy product. Combination of favourable temperature & in the wetter margin of temperate latitude with support of highest quality of milch cattle breed, the commercial dairy farming have evolved. Denmark and New Zealand represent important examples. The commercial dairy farming in absolute term of milk production includes India, the tropical monsoonal country that is the leading producer of milk in the world. Moreover, as the consequent of truck farming, commercial dairy farming have evolved in worldwide network around the big city irrespective of the prevailing climatic conditions.

Milk Quality : 2300 kg/lactation ; India : 900 kg/lactation

↓

Health, hygiene, fodder capacity.

* Mediterranean Agriculture → Crop

Food + Livestock + Horticulture

Cash Crop

* Horticulture : Food, flower, vegetable

Truck farming : Horticulture + Comm. Dairy Farming

Bulgaria – Rose & Netherland – Tulip.

C. SPECIALISED AGRICULTURE :=

This category of agriculture involves specific agro-climatic condition combined with specified technique leading to the production of specialised variety of agricultural yields. This category includes mediterranean agriculture, horticulture with truck farming and plantation agriculture.

(i) Mediterranean Agriculture : It represents its specialisation in minimising the dependency on water and maximising diversity and productivity of agricultural yield. Specific type of intensive commercial mixed farming, it involves cultivation of food crops (wheat-winter), cash crops (cotton, tobacco), rearing of animal (largely sheep, goats) as well as cultivation of horticulture plants

involving the natural stand of figs, olive and citrus variety of food. It is this combination that makes mediterranean agriculture specialised type and mediterranean regions "gardens of the world" along with being hot land for wine industry.

(ii) Horticulture :=

Horticulture as specialised agriculture depicts intensive commercial agriculture exclusively relating to production of fruits, flowers and vegetables. This typology apart from including mediterranean region and temperate countries have elaborated itself with cascading growth of China and India as leading producer of horticultural produce with widest variety reflecting diverse agro-climatic condition as truck farming horticulture not just get combined with commercial dairy farming but also represent its worldwide extension.

(iii) Plantation : Specialised agriculture, plantation agri. is sub-divided as traditional and non-traditiona categories.

The traditional plantation correlate to crops that sustain supply of produce for 25 to 30 years making it mandatory to have specialised

implementation of crop stand, wheat control techniques and harvesting techniques with coffee, cocoa, spices and rubber. This extensive commercial typology is primarily confined in equatorial belt as non-traditional plantation — same stand of crops providing yield for 2 to 3 consecutive cropping season. Crops like sugarcane and cotton are included in this category. This typology with sugarcane extends upto wetter tropics (Brazil, India) but with crop like cotton it extends to dry tropical countries (Egypt, Pakistan).

WHITTELSEYS : BASIS OF CLASSIFICATION

The 13 typologies outlined by whittelseys were based on 5 different criterion that include :

(1) Crop and livestock combination (priority basis)
(2) Intensity of use of land, labour and capital
(3) Methods of growing and stalking
(4) Methods applied for disposal
(5) Ensemble of infrastructural input.

CROP	LIVESTOCK	COMBINATION
Shifting	NH	Sedentary
With paddy	LR	Mixed Subsistence
W/o paddy	CDF	CMF
CGF		Mediterranean
Plantation		Truck Farming
Horticulture		

AGRICULTURAL REGIONS OF INDIA

Agriculture regionalisation in the country is primarily based on the fact that crop cultivation continues to dominate agricultural areas and output in the country. Moreover, variations in the cultivated crops in terms of area devoted and commercial value of the crop empirical method of generally combined crops is taken into account to distinguish agricultural regions. The demarcated region includes

(i) Horticultural Region

(ii) Rice Region

(iii) Wheat Region

(iv) Cotton Region

(v) Nutri-Cereal Region (Maize Region)

Mixed Cropping

Crop Rotation

- Rotation of crops on seansonal basis

Inter-Cropping

- More than one crop being produced in single season in same field together.

MAP-18 **PASSES** ⛰ (Depend on Alignment)

J&K : Kilik, Dawan, Parpik

Crops : Rice - Awadh, Assam, Kerela (Major), Minor

Wheat - Punjab, Haryana, M.P. & Minor (Gujarat)

LECTURE = 63

Date 24/04/2014

① HORTICULTURE REGION :

- Prevailing agro-climatic condition combined with absence of availability of flat areas makes entire northern mountain wall prominent horticulture zone of country. Elementary distinction is outlined between north-western Himalayas where prominently temperate variety of fruits (apple, pears, plums), vegetable (potatoes), flowers (lily, tulip) along with spices (saffron) are cultivated. Compared to it, North-Eastern hills are primarily known for tropical variety as pineapple, brinjal, cabbage, marigold and ginger as important produce.

Horticulture in the country is primarily benefitting from non-flagship agriculture development program called National Horticulture Mission. In demarcated horticulture region, less priority combination crops includes food crops — rice, wheat and barley.

② RICE REGION :=

The agricultural region corresponds to humid/par humid location combined with fertile lowland of alluvial soil. This agriculture region marks its elaborate extension all along the northern plains of India as well as coastal plains. It is this large expanse that makes this region correlate to significantly big range of combination ~~of~~ crops. Among the prominent examples are – Jute in WB, Tea in Sub-Himalayan WB & AS, wheat in Awadh plains of UP, Oil-seeds in BR, pulses in OD, Tobacco in AP, Sugarcane in TN, Rubber in Kerala, Coffee in KA and nutri-cereal (Jwar) in MH & GJ. This agricultural region involves the benefits of 1st Generation Green Revolution along the deltaic plain and in the contemporary profile incorporate the benefit of flagship program of Indian agriculture development NFSM (National Food Security Mission). Along with it range of

sub-programs as part of another flagship program called RKVY specifically involving program called 'Bringing Green Revolution to Eastern States' forms important example.

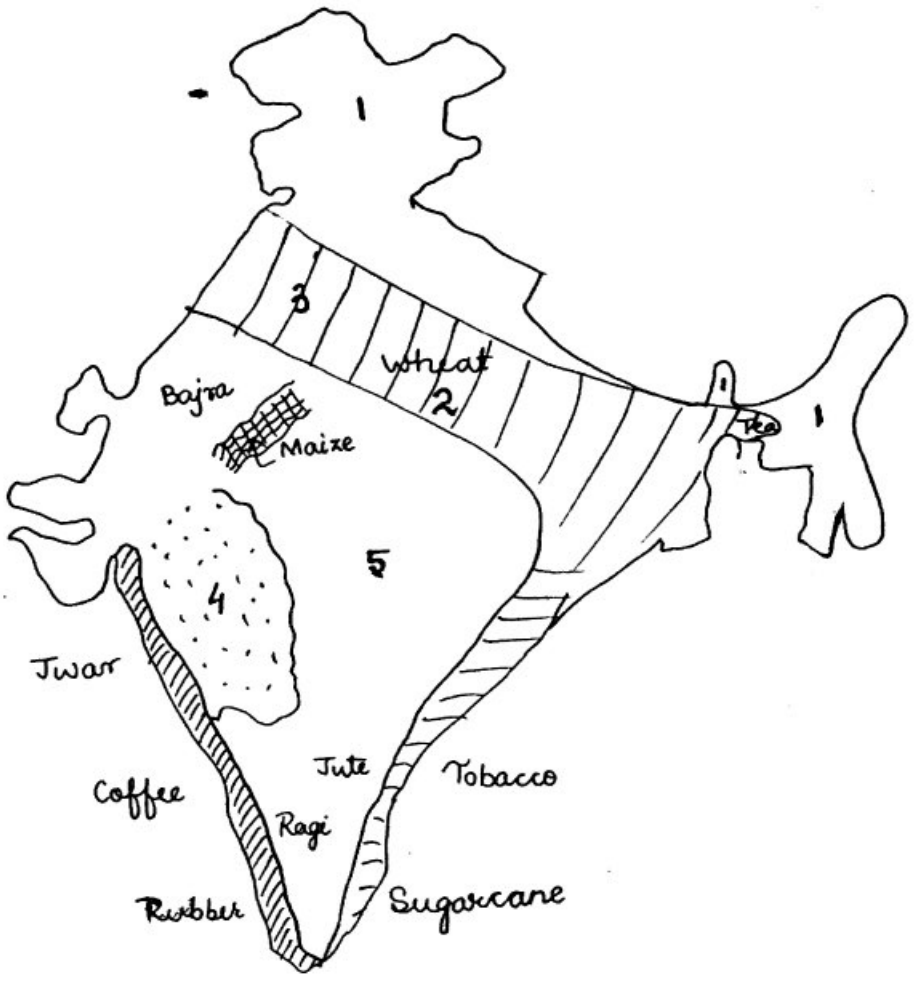
This agriculture region is referred of its diversity primarily due to its size making it distinguished from the wheat region.

③ WHEAT REGION

The wheat region marks its confinement in NW^{n} plains of the country including Satluj-Yamuna Plains and Rohilkhand Plains of UP. Inspite of its restricted expanse, this agricultural region involves matching diversity to that of the rice region as this region represent the most successful location of 1st Generation GR involving production of wheat, rice, maize-like food crops; cotton, cane like cash crop along with wide range of pulses and oil seeds.

This region thus also involves benefit of food security mission and RKVY.

In the present perispective, induction of sustainable culture marks the diffusion of diversification program 2013-14 of original Green Revolution areas under RKVY.



1 - Horticulture

2 - Rice Region

3 - Wheat

4 - Cotton

5 - Nutri-Cereals

④ COTTON REGION :=

The cotton region is confined in the black soil belt of Indian Peninsula. This region involves benefits of 1st Generation GR. Favourable agro-climatic condition makes this region involve big range of combination crop where Jwar, Sugar Cane, Pulses, Oil-seeds and horticultural produce are prominently included. The region involves the benefit of both the flagship programs along with being the priority zone of cotton technological mission - the non-flagship program surrounding this agriculture region and covering major part of peninsula.

⑤ NUTRI-CEREAL REGIONS :=

The nutri-cereal region, nearly corresponding to entire red soil belt, includes prominent cultivation of food grains in combination to pulses and oil-seeds. In region specific demarcation, Chambal Valley correlates to cultivation of maize which is designated to be transitional nutri-cereal in terms of its location between food crops in Northern Plains and cash crops in peninsula.

Maize as the crop and thus maize sub-regions involves the benefit of non-flagship program ISOPOM (Integrated Scheme of Oil-palm, Pulses, Oil-seeds and Maize). For the entire nutri-cereal belt, Jwar occupy maximum expanse with Bajra, confined primarily in Arid location of Rajasthan and Ragi in the plateau interiors of KA & TN. Overall, this agricultural region involves the priority benefits of nutri-cereal development program and 'nutri farm 2013-14 program' under RKVY.

50% Indian Children are underweight in age group of 0-5-years; at par with African nation.

Nutri-farm : Targetting nutri-cereals in those locations where extreme hunger is prevailing. It is so this crop is best suited there.

15 Agro-climatic conditions

Narrow neck of W.B. is called sub-Himalayan W.B.

AGRO-CLIMATIC REGIONS OF INDIA :=

① Demarcated by Planning Commission in collaboration with National Remote Sensing Agency, National Atlas Thematic mapping organisation and zonal planning teams.

② It is demarcated as regional planning units to outline prevailing problem prospects of different agro-climatic zones.

③ Orientation of demarcation is to recognise planned course of development to register growth in agriculture and eliminating persisting regional disparities. The demarcated regions include :=

- (i) NWⁿ Himalayas Region
- (ii) NEⁿ Himalayas Region

} Mtns.

- (iii) Satluj - Yamuna Plain
- (iv) Upper - Gangetic
- (v) Mid - Gangetic
- (vi) Lower - Gangetic
- (vii) Eastern Coastal
- (viii) Western Coastal
- (ix) Western Rajasthan

} Plains

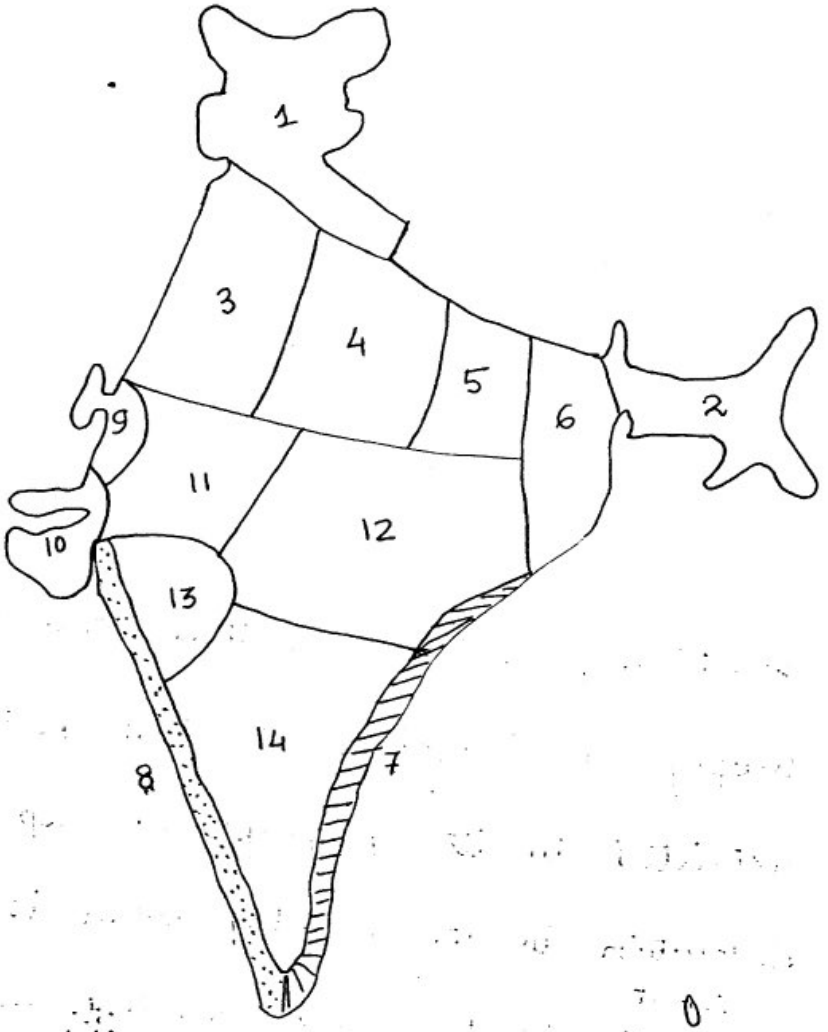
- (x) Gujarat Region
- (xi) Aravalli - Malwa Region
- (xii) Eⁿ Plateau

} Plateau

(xiii) Maharashtra Plateau } Plateaus

(xiv) Deccan interiors

(xv) Islands } Island



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GREEN REVOLUTION & ITS IMPACT

In the beginning of 1960s, agriculture development program introduced in the country with the fundamental objective of increasing production of food crops to feed growing population is called Green Revolution. Technically, the term correlates to large scale diffusion of high yielding varieties of seeds which resulted in exponential changes in the output from the field. These corresponds to twin characteristics of these seeds that are being scale-neutral and having shorter life-span. However to practically gain from these characteristics assured supply of irrigation, chemical fertiliser, made it restricted in its geographical expanse. Green Revolution in the country when is analysed of its impact, both positive and negative outcomes are clearly outlined.

In the positive category, increased diffusion of agricultural infrastructural inputs facilitated vertical growth of agriculture which resulted

in increase in the total output, productivity and cropping intensity. In the cascading effect, Indian agriculture evolved beyond subsistence level creating possibilities of movement of surplus produce that facilitated ON & OFF farm employment opportunity. Growing buffer stock in the country paved way to establishment of food corporation of India, which enhance administrative capacity in sustaining economic interest of both producers & consumers along with the beginning of PUBLIC DISTRIBUTION SYSTEM (PDS) catering to inclusive development requirement of country.

The negative/unfavourable outcome of 1st generation GR is largely correlated to development of economic and ecological anamolies. In economic perspective, regional disparities, social disparities and agricultural disparities are taken into account. This generation of

GR remained confined to limited region including Punjab, Haryana, Ganganagar (RJ), Rohilkhand (UP) & deltaic plains of 4 major peninsular rivers. With rest of the country failing to benefit from GR, elaborate regional disparities evolved in the country. Even within the region of successful GR it was largely rich farmers who multiplied their capacity with poor farmers left behind resulting in unequal societal set or disparities.

Generation One GR influenced only 4 crops :=
WHEAT, COTTON, RICE, CANE making it failed to cater the requirement of complete agriculture development creating agricultural disparities.

All these economic anamolies were attempted to be corrected since the beginning of 1970s in mobilisation of RAINBOW REVOLUTION, with specific target on unfavourable agro-climatic location along with small & marginal farming.

ECOLOGICAL DISPARITIES :-

The ecological disparities evolved as the -ve outcome of 1st Generation GR includes : SOIL EXHAUSTION , SALINISATION , DEPLETING GROUND-WATER TABLE due to excessive utilisation of infrastructural input so as to mobilise market based agriculture. It is contemporary orientation where crop ecological zonation in the lines of resource-based agriculture is the attempt called 2nd Generation GR or Evergreen Revolution.

INFRASTRUCTURAL INPUTS IN INDIAN AGRI.

Vertical growth of agriculture initiated with GR Generation One corresponds to the artifical support system indured in agricultural field called infrastructural inputs. Importance of these inputs is further justified by the fact that there is consistent decrease in per capita availability of land due to consistent increase of population

In the domain of RKVY, agricultural infrastructural inputs include irrigation, chemical fertilizers, HYV of seeds as the major constituents with agricultural credit and commercial energy as minor constituent.

IRRIGATION

India is designated to be water surplus country accounting for ~4% of the fresh water resource of the world. At present technological level, utilisable fresh water resource is ~1800 billion cubic metres, out of which actually utilised fresh water resource base is 1100 BCM.

In projection of planning commission. by year 2025 when India will become the most populous country of the world then also at this utilised level, India will be water-stressed and not water-scarce country. Significance of irrigation therefore correlates to the fact that water resource

distribution in the country is highly uneven both in terms of time and area.

* 1966 Drought ⇒ Tube well + Well account 60% of irrigation
* Command area development
* Canal irrigation a/c for 30%
* 10% irrigation are thro' other means.

MEANS OF IRRIGATION

The means of irrigation developed in the country includes tube-well, well, canal irrigation as major means of irrigation. Among the other means: tank, sprinkle and drip irrigation are included.

The tube-well irrigation formally initiated after 1966 drought in combination with well account for 60% of irrigated areas of the country. Locationally this means of irrigation is well developed in Western, North-Western part of the country wherein Gujarat has the maximum of its area as tube-well irrigated.

UP account for maximum tube-well irrigated area of the country. This means of irrigation correlates to more than 80% of water use efficiency and facilitate multiple watering and have clear ownership rights as its positive dimension.

CANAL IRRIGATION :

Canal irrigation marks its formal beginning way back in 1948 with country's first multipurpose river valley project : DVC coming into being. This means of irrigation presently accounts for 30% of the total irrigated area with well-developed network in the alluvial lowland. Geographically, Chhattisgarh has maximum of its irrigated area as canal irrigated. However, it is UP which account for largest share of country's canal irrigated region. This means of irrigation has low water-use efficiency of 20-30%, high construction and maintenance cost, unclear

ownership rights as restricting factor. However, in region like the Northern Plains of India with conservative agricultural field, this is the best means of irrigation, which also sustain multiple water requirement of cultivated crops.

Tank Irrigation :

Tank irrigation developed in crystalline plateau interior (AP, TN) catering to the requirement of scattered agricultural field and crops that require single watering forms traditional means. This category also includes sprinkle irrigation (> 90% water-use efficiency) and drip irrigation (100% water-use efficiency) as modern means of irrigation.

Sprinkle Irrigation : The sprinkle irrigation has primarily evolved in the states of Rajasthan, MP, and reveals the limitation of 'Randomness of watering', negatively

influencing quality and quantity of yields.

Drip Irrigation: Drip irrigation has been successful as pilot project in Kerala and largely lacking in its potentialities in multiple-cropping (multiple stand) patterns of the country.

Date 25/04/2014

Geography Lecture : 64

INFRASTRUCTURAL INPUT : FERTILISERS

Chemical fertilizer as the agricultural infrastructural input involves its significance in ensuring the favourable utilisation of high yielding varieties of seeds. Prodⁿ & Consumption of this input dates back to early 1950s. Presently India stands as 4th leading producer of chemical fertilizers in the world with near self-reliance in nitrogenous fertilizers, partial dependency on imports for phosphorous fertilisers and complete dependency on imports for potash fertilizing agents. Consumption levels of chemical fertilizers have marked cascading increase and is presently at 144 kg/ha. This however represents elaborate regional disparity with > 200 kg/hectare consumption levels in Punjab, AP & Haryana to as low as 5 kg/ha in Arunachal Pradesh and Nagaland. In addition, continuation of urea (nitrogenous fertilizer) as a the most subsidised commodity, disproportionate composition of nitrogenous fertilizing agents have resulted

into creation of soil exhaustion like ecological problems. In order to correct these dimensions of prevailing anamolies under RKVY, new investment policy (2013), Nutrient-based subsidy Program (2010), and Fertiliser Monitoring System (FMS) under New Fertilizer Policy — are imp. programs. The notified New Investment Policy is for urea-sector oriented towards minimising the cost of production by encouraging brown and green field investments in urea production substituting the traditional feedstock naphtha by natural gas. Distinguished from it Nutrient-based Subsidy Program forms the program oriented to increase the consumption levels of phosphorous & potash fertilisers. At present, it includes seven diff. grades of complex fertilisers where annual subsidy is granted by Union Govt. on per kg basis with the producers or retailers having the authority to ascertain MRP. At present, 15 % of the MRP is

provided as subsidy with rest beared by the farmer. The FMS is the scheme oriented towards generating the data of consumption pattern, trend & composition so as to correct the persisting anomolies and develop area-based programs to enhance consumption of chemical fertilizers.

3RD INFRASTRUCTURAL INPUT: HYV of SEEDS

High yielding varieties / hybrid-varu of seeds are fundamentally related to the vertical growth of agriculture. Both its characteristics of being - scale neutral & have shorter life-span have resulted in successful increase in diversified yield of agriculture in the country. The Indian National Seed Program involves dominating role of Indian Council of Agri. Research and state-level agricultural universities in the development of the seeds. Under this program, 2 corporations : National Seed Corp. and State Farm Corp. of India forms the public sector enterprises relating to the distribution component of the seed program. In this setup of the

functioning consumption pattern of HYVs reveals major regional disparity with successful green revolution states marking diffusion of these seed-varieties to >90% of their total cropped areas whereas in most of the NE^{n} States it is still less than 20% of the total cropped area. Under RKVY, the objective of minimising differences of prod^{n}/productivity of a crop in different regions: transport subsidy program & Seed-sub-mission have been introduced.

(i) The Transport Subsidy on the movement of seed was formally launched in 11th Plan oriented towards ensuring timely availability of affordable seed & planting material in hilly & remote areas of the country specifically in NE^{n} States. Distinguished from it, the

(ii) Seed – Sub-Mission under National Mission on Agriculture Extn. have been initiated in current Plan period targetting involvement of private players in development of these seed varieties, Diversification of range of seeds

in compliance to Cartigena Protocol on Bio-Safety.

OTHER/MINOR INFRASTRUCTURAL INPUTS :

The minor infrastructural inputs includes agri. credit & commercial energy — which continues to represent restricted mobilisation with lack of possibility of evolving regional pattern. For the agri. credit, well developed multi-hierarchical network involving national bank of agricultural and rural devp., state level bankers committees, district centre cooperative banks along with primary agri. credit societies have been added with self-help groups, bank linkage programs to ensure flow of credit, financial inclusion and simplifying the credit availability processes. The Kisan Credit Card is projected to be the most successful dimension towards attainment of these objectives which has been enlarged not just to cover all country & all farmers but also the risk-cover on accidental death & accidental permanent disability. This networking, however, involves the persisting challenge of timely diffusion of information to the target group restricting its benefit. In commercial

energy, agriculture sector have been provided with marginal share of commercial energy produced in the country reflecting energy starved states of the country. In all the three programs of MoN&RE (Ministry of New & Renewable Energy) - National Solar Mission; Biogas & Biomass Program and wind resource assessment program*, mobilisation of OFFGRID POWER GENERATION in de-centralised mechanism is being targetted towards ensuring energy supplies to agricultural sector for its further growth.

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* Still at assessment level
* Kishan Credit Card.
* Green Revolution : 1960
  ↳ {3 Major Infrastructural Input
  2 minor " "}
  ↳ Resulted in Vertical Growth of Agri.
  ↳ Measured as:
  - Cropping Intensity
  - Agri. Productivity

Vertical Growth : Same land harvested again & again
Regular Cultivation

Indian : 3 Cropping Seasons. → Land Cultivated 3 times a year in India.

* Agri. Productivity levels today : 4000 kg / ha
(Output / Area)

* Intensive culture have higher productivity because land area used is more compared to extensive mechanised culture.

VERTICAL GROWTH OF AGRICULTURE :

Agricultural infrastructural input combined with natural conditions forms the regulators of vertical growth of agriculture which is formally measured as :-

(a) Cropping Intensity

(b) Agricultural Productivity.

The Cropping Intensity as the measure of vertical growth of agriculture is defined to be the ratio of cultivated areas and net sown areas expressed as %. In Indian context, where annual cycle involves 3 cropping seasons, theoritical levels of cropping intensity is specified at 300%. The practically achievable levels, however, is demarcated b/w 240 – 250%. Clear regional disparity in the attained level of cropping intensity justifies variations in natural agro-climatic conditions

along with diffusion of infrastructural inputs. The pattern of cropping intensity divides the country into 3 well-defined categories :=

(i) High CI (more than national avg.)
(ii) Low CI (less than national avg.)
(iii) Moderate CI

HIGH CI

With more than 160% of CI levels largely includes successful green revolution areas Satluj-Yamuna plains, Rohilkhand, East Coast Deltaic plains, Ganganagar along with Chambal Valley and black soil region of peninsular. In all these regions favourable & well diffused infrastructural inputs combined with favourable agro-climatic conditions justify higher CI levels.

LOW CI. REGIONS

Less than 60%, this category includes unfavourable physiography & climate locations as N^{n} Mountain Wall, Great Indian Desert which also reflects restricted diffusion of agricultural infrastructural input with poor societal status of large farming community. In this category,

TRADITIONAL PLANTATION Crop regions as rubber and spices plantation (Kerala), Coffee plantation (Karnataka) and tea plantation (Assam, sub-Himalayan WB) are also included as similar 3-fold yield from these agriculturally developed regions are not attained reducing cropping intensity levels.

MODERATE C.I.

Involving the range of 60 to 160 %, this category includes favourable agro-climatic regions with rain-fed agriculture. They clearly mark major fluctuations in CI levels in accordance to the patterns of precipitation.

* Prime regulator of Vertical Growth = Infrastructural Inpu
* ∀ 2000 Kerala = Isolated Rural Population.

(B) ⇒ AGRICULTURAL PRODUCTIVITY

(i) Output / Area i.e. kg/ha

(ii) Regulated by natural factors and agri. enfrasbructural inputs

(iii) Well-defined regional pattern:

(a) High agri. productivity (> 4000 kg/ha):
Green Belt Areas

(b) Low agri. productivity (< 2000 kg/ha)
- Unfavourable locations & traditional plantation locations

(c) Moderate agri-productivity (2000 - 4000 kg/ha)
- Rainfed agri-regions

AGRICULTURAL CAPABILITY

This measure of agricultural development is defined to be input cost per unit area. Higher input cost, thus, represent decrease in agricultural capability. Practically, agricultural capability is utilised to demarcate CROP ECOLOGICAL ZONATIONS. It is because the areas conducive for the cultivation of specific type of crop will require lesser infrastructural input support and will result in higher sales realisation. Agricultural capability, therefore, is applied in resource-based agriculture combined with infrastructural inputs of agriculture.

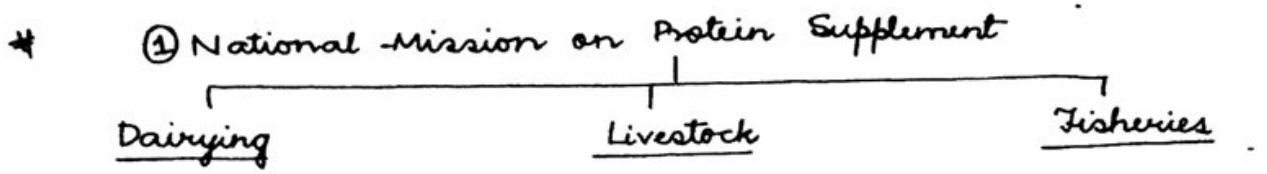
* RAINBOW REVOLUTION → White → Blue → Silver etc → Red & Brown
- Protein Mission : National Dairy Program
Poultry
Fisheries etc

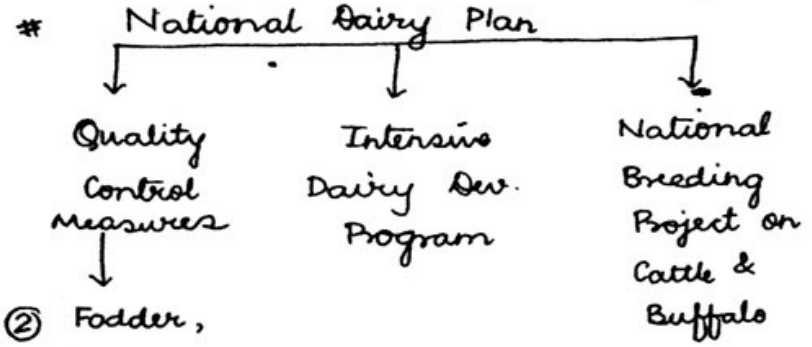
WHITE REVOLUTION

India is leading producer of milk in world since 1997 with milk standing out to be second prominent agricultural commodity after rice in both quantity and value. Under the domain of department of Livestock, Dairying and Fisheries, Dairy Culture is being mobilised as National Dairy Plan (2007-08 to 2021-22). The beginning of WR is traced back to early 1970s when NDDB ( ) initiated world's largest dairy development program with the objective of interlinking remotest milk producer in the rural area with the urban consumer. In order to facilitate this link multi-hierarchical cooperative setup was established making milk farmers not just attain the legitimate price of their milk but also range of benefits due to scale enlargement. Cascading increase in number of village cooperative societies justified the participation and cascading growth in milk production justified the success of

generation I WR. This success analysed in globalised economic setup reveals big range of adversities prevailing in the sector. The leading milk producer of the world near completely lacks in the global market share of milk-trade. It is because Indian milk standards largely fails to satisfy FAO Standards due to high counts of pesticides, insecticides and viral diseases. Moreover, in terms of productivity levels lower lactation capacity makes India project marginal 980 kg/lactation as compared to 2038 kg/lactation as global average. Moreover, inspite of producing >60% of milk as buffalo milk which have substantive fat content, India completely lacks in dairy processing capacities. Under RKVY, implied programs to sustain White Revolution correct the existing anamolies and increasing the value addition retention among the farmers, 2 programs: National Mission on Protein Supplement and Accelerated Fodder Crop Development Program

have been initiated.





The National Dairy Plan as 2nd generation white Revolution therefore incorporate 3-fold clauses of development :

i) Quality Control Measures

Intensified Dairy Development Plan

National Project on Cattle & Buffalo Breeding

In the Quality Control Measures, priority is provided to health, hygiene of animals along with feed, fodder quality control. In the category of health-hygiene, creation of awareness among the dairy

farmers in regards to immunisation, hygiene of the livestock along with disease-reporting & verification system have been initiated. This system involves timely reporting the beginning of symptoms of diseases and immediate rescue measures to minimise the loss. On the category of feed-fodder, fodder crop development program involves NDDB which has recognised Wn Rajasthan, En Plateau and Sn part of Deccan interiors as exclusive fodder crop potential locations of the country. Under intensified Dairy Development Program, milk processing not just to enhance value-addition retention among the farmers but also to minimise perishable nature of milk and economically utilised high-fat content of buffalo milk is targetted.

The project on breeding launched in year 2000 incorporate not just the breed enhancement strategies by application of

biotechnology but also correcting the decline in original lactation capacity which has evolved due to generation of ignorance & incapability towards sustaining animal health. This project is being implemented at par with the compliance of Cartigena Protocol on Bio-Safety.

Map:

Page: 34 : Irrigation
IG Canal

Page 37 : Plantation : Tea
Coffee
Rubber

Date 26/04/2014

LECTURE: 65

AQUACULTURE

Aqua-culture or Blue Revolution forms an important dimension of agricultural diversity attempted in the country towards enriching existing food basket along with incorporating inclusive growth prominently of landless labourers & marginal farmers. Under the domain of Deptt. of Livestock Dairying & Fisheries mobilisation of Blue Revolution has been significantly slow in the country attributed to

(i) Rich diverse agro-climatic conditions on land
(ii) Dietary Indian culture
(iii) Cyclone-prone marginal water bodies.

As the outcome of farmers synergetic development programs mobilised by National Fish Dev. Board that from the beginning of 2001 to marginal farmers in both freshwater & marine aquatic environment have been mobilised. For market-oriented production Indian aquaculture reserves ranges from freshwater shallow lakes to extensive exclusive economic

zone collectively accounting for >10% of the global aquacultural diversities. In addition to shell and fin fishes wide range of planktonic aquatic resources also corresponds to the country. In the decentralised structure under NFDB including fish farmers development agency (FFDA) and Brackish water fish farmer dev. agency (BFDA, cascading growth in aquaculture makes India 3rd largest producer in the world accounting ~5% of the global aqua-cultural produce. Mobilisation of this sector as market oriented sector justifies its growth in accounting for 20% of agricultural export from the country. The constituents of export includes both food fish and ornamental fishes. For the sustenance of the momentum under RKVY, National Mission on Protein Supplement primarily targets domestic market enlargement by creating awareness in regards to the nutritional values correlating to the aquacultural

produce. In addition mobilisation of near completely unutilised marine aquatic environment is given priority. For the current plan period priority targets for the sector includes :

(i) Enlargement of biotechnology in the sector

(ii) Enhancement of sustainable clauses

(iii) Increasing post-harvest handling capacity

Incorporation of biotechnology ranges from development of fish seed varieties to the proper fish food supplies. It involves Indian obligations to comply with biosafety protocol. However, it targets "Quick Growing Varieties" of neclonic creatures to accelerate production & productivity

The clause of sustainability attains its priority with the fact that >50% of aqua-cultural yield in the country is from fresh-water sources which have highly depleted water quality due to pollution. Apart from integrating National Aquatic Ecosystem Conservation Program (2013), it also includes specific mobilisations as complete

restrictions on commercial aquaculture during the breeding season.

- The post-harvest handling in the absolute domain of NFDB integrated with Ministry of Food Processing Industries involves the objective of primary & secondary handling and capacity development largely to minimise perishable nature of produce along with providing value-addition benefits to the farmers that represents poorest hierarchy of farming population.

(Paddy Culture in India)
- Transplant culture/method
- Labour-intensive culture
- Water-logged conditions
- Fishes can be made to grow simultaneously
- 2 yields
- With the help of biotechnology.

Primary processing — Cold storages

Secondary processing — Drying, Packaging

Kishan Vision Project :

Primary Process $\xrightarrow[\text{links}]{\text{transportation}}$ Secondary Processing

POULTRY - CULTURE

CPDO: Central Poultry Development Organisation

Inclusive agriculture development in the country involves poultry sector as one of the traditional constituent involving almost every rural household of the country. Growth of poultry sector is largely attributed to efforts taken up by CPDO working under the Deptt. of Livestock, Dairying and Fisheries. The sector has evolved as highly decentralised and well-organised agricultural sector which involves rearing of chickens, hens, geese, turkeys, domestic fowl and ducks reared for their feathered skin flesh and eggs. This sector of agriculture represents its characteristics as less capital intensive sector with significantly high-valued product combined with its labour intensive characteristics. With the growing urbanisation levels, there has been substantive growth in the market of aquacultural produce. Geographically peninsular states (MH, AP, KA) dominates in poultry culture

with WB being the only major exception. Development of this sector has facilitated economic mobilisation of poorest quarter of the agriculture labours with CPDO providing entire range of monetary & technological support. Indian status as one of the leading producers of eggs in the world (Silver Revolution) and of flesh (Red Brown Revolution) justifies the success of the sector. Under RKVY, National Mission on Protien Supplements emphasizes on creation of "SUSTAINED MARKET" of poultry sector produce in the country specifically eggs. It involves elaborate participation of National Egg Dev. Council that incorporate commensal services towards generating the awareness on regular basis. In addition, creation of awareness among the producers is targetted ~~heavily~~ avenue of poultry capital venture fund in order to minimise recurring epidemics

and thereby long-term loss created for economically sensitive farming population. The Capital Venture Fund is also utilised for enhancing commercial utilisation of by-products as feathers and skin in the sports-good sector and tannery works respectively.

{Apiculture, Sericulture} – Not part of Rainbow Revolution

{Regional Disparity, Societal ", Agricultural "} -ve impact of Green Rev.

(Economical Impact) (Ecological Impact)

Honey – Exported to West Asia & USA

Entire growth of honey bees in N^n plains regions.

Honey – Mainstream use in Ayurveda medicines

Dabur Pharma : Honey farms

Diversification of agriculture → Write about apiculture

Documentary on APICULTURE on Discovery Channel.

APICULTURE

Rearing of honey bees is recognised to be traditions agriculture practice in the country which makes honey bees being designated as social insect of the country. This sector involves prodn of royal jelly and Propolis of bee-hives as commercially viable produce. These are primarily utilised as direct consumable item with range of health benefits along with being the input in production of health tonics, lip-balm along with production of candles. Apiculture is prominently evolved in Nn plains of India in entire stretch from Punjab to W.B. As formal constituent of horticulture in the country, it is the beneficiary of non-flagship program of agriculture development called National Horticulture Mission. The present status of this sector represents restricted prodn. of some 70000 tonnes of honey annually with evolved marketing links in West Asia and USA. The sector lacks in reqd. priority for its mainstreaming as important constituent of

horticulture. In the present initiatives involving mainstreaming of ~~Ayush~~ AYUSH in the National Health Mission substantive momentum is projected for the sector as one of the big pharmaceutical giant Dabur Pharma has involved itself in apiculture for cost effective production of honey. Moreover, exponential growth in packaged processed/semi-processed food resources involving ever increasing use of honey as important ingredient have facilitated big players ITC and HUL to incorporate apiculture farms for consistent supplies of honey. This agriculture sector, therefore represent sound prospects in the likely future.

× × ×

Diversification of agriculture

Silk production - Agriculture Sector

Silk textile - Manufacturing Sector

- Cotton Textile
- Silk Textile
- Jute Textile
- Woolen Textile

* Karnataka (Bangalore - Mysore Tableland) - Silk production
* Central Silk Board
* 5 Commercial Varieties
* Vanya Silk : 4 Varieties

SERICULTURE

In the textile industry sericulture marks second prominent rank after cotton textile. This culture is recognised to be long-chain of interdependent economic activity that involves unclear boundary between agricultural sector and industrial sector. India forms 2nd leading producer after China in world for sericultural produce. With representing commercial edge over China in producing 5 commercial varieties of silk: Mulberry, Eri, Muga Tropical Tasar and Oak Tasar. In demarcation by Central Silk Board 4 major varieties except Mulberry is called VANYA SILK that involves traditional forest dwellers and ST population. The production pattern of sericulture in the country reveals KARNATAKA as the leading producer accounting for near 50% of silk production of the country that prominently includes Mulberry Silk. The imp. sericulture centres in the state includes Bangalore, Mysore, Hassan, Kolar, Tumkur and Belgaum.

J & K with Srinagar, Baramullah, Udhampur, Anantnag and Jammu, & W.B. with Haora, Kolkata, Murshidabad and Bankura forms the other major producers. In the reference of Vanya Silk countrywide diffused sericulture however is identified:

The development of sericulture from the traditional setup to the modern commercial orientation paved way to realisations of persisting challenges that the engaged professionals are faced with in order to sustain interest of producers & consumers milestone developments in the sector introduced by Central Silk Board involves:

(i) Silk Mark Scheme

(ii) Geographic Indication

While silk mark scheme has been oriented towards creating grade separation in the market between pure silk and fake silk-alike synthetic fibre. Geographic indication caters the interests of traditional artisans who have evolved the specific type of weave by investing generations.

Requirement of geographic indication evolved with the utilisation of cheap Mulberry Silk in the production of fake weave under the provision of geographic indication the product gets registered making it distinguished with special market oriented stamp or certificate. Among the registered product in geographic indication Mysore silk (KA), Kanjeevaram Silk (TN), Paithani (MH), Chanderi (MP), Pochampalli (AP), Baluchari (WB) and Ikkat (OD) represents major categories with Assam involving geographic indication of Eri and Muga as minor category

POTENTIALITIES

Potentialities of sericulture primarily correlates to:

(i) Utilisation of silk waste

(ii) Multiple yield production

At the level of <u>silk-reeling</u>, there is the development of silk waste. This actually incorporate substantive commercial value as by-product which can be utilised to extract oil, utilisable in production of toiletary items as well as

cosmetic products. After extraction of oil the coarse remains can be utilised for production of poultry / aquaculture feed. These multiple value addition mobilised in China have been the reason of added economic incentive that Indian silk farmers & weavers are deprived of. Secondly the prevailing agro climatic conditions in the country involves the potentialities of 4 to 5 yields per year Though the country is producing maxm. of 2 yields per year denoting sound potentiality for the sector. With silk culture involving decentralised characteristics involving traditional forest dwellers with high value of product in the market, it is identified to be one of the important sectors for inclusive diversified development.

Apiculture } Not part of rainbow revolution
Sericulture }

Generation II of Green Revolution :

(i) Dry land Farming (Yojana)
(ii) Social Forestary (Kurukshetra)

→ Climatological Drought - Bad monsoon
→ Hydrological Drought - Femine
→ Agricultural Drought.

2ND GENERATION GR / EVERGREEN REVOLUTION

The clause of sustaining economic growth simultaneous to ecological potentials is highlighted in second generation green revolution. These clauses formally includes mobilisation of dry land farming practices and social forestary.

THE DRY LAND FARMING

Implemented in the country, this involves all the rainfed agricultural zones which collectively accounts for 990 million ha of cropped area supporting 60% of livestock population & contributing near 40% of food crop production of the country. This area therefore includes par humid, humid, sub-humid semi-arid and arid locations where precipitation variability marks continuous increase in the respective sequence multiplying the clause of reoccuring agricultural drought. Agricultural drought is defined to be the condition when a region experiences less than 50% of normal rainfall for 4 consecutive weeks during advancing

monsoonal season.

Map Marking : (Date : 26/04/2014)

Peaks of India

(i) J&K

Karakoram Range : K2 (8611 m)
Gasherbrum I (8068m)
Gasherbrum II
Masherbrum
Disteghil Sar

Great Himalayas : Nanga Parbat (8126m)
Haramukh
Nunkun

(ii) Uttarakhand : Nanda Devi
Dunagiri
Kamet
Nanda Kot
Trisul
Chaukhamba

(iii) Rajasthan : Guru Shikhar

(iv) Kathiawar Peninsula : Sarkala (highest of Kathiawar)
Venu

(v) Gujarat : Pavagarh (highest of Gujarat)
Vindhyan's part

Date
27.04.2014

Lecture 66 Dry-land farming (contd.)

RAINFED AGRICULTURAL REGIONS

The components of dry land farming mobilised in the country includes:

(i) – Land Mgmt.
(ii) – Crop Mgmt.
(iii) – Water Mgmt.

The land mgmt. component apart from involving the clause of levelling the land it also includes the practical implementation of deep ploughing to facilitate utilisation of soil moisture by the sown seeds or saplings. Badland topography development board (BTDB) along with Survey of India are primarily engaged in land mgmt. component.

In crop mgmt., selection of drought-resistant varieties of seeds along with drought resistant varieties of crops are targetted to minimise the risk of crop failure along with depleted quality/quantity of yield.

In the mgmt. of these 2 components, water mgmt. is, though simultaneously catered, it also includes mobilisation of lesser water-dependent varieties of crops along with mobilisation of local techniques

of rainwater harvesting & mgmt. of surface runoff. Practical implementations of dry-land farming in the country have facilitated substantive diversified growth of agriculture which, however, remains marginal when compared to irrigated areas of the country. Moreover, rainfed regions correlates to "ECONOMIC & ECOLOGICAL SENSITIVITIES" which has restricted the diffusion of developed agricultural techniques. Taking these factors into account under RKVY, program called "Rainfed Agricultural Development Program" involves stronger orientations towards removing fragile economic characteristics of farming population which targets :-

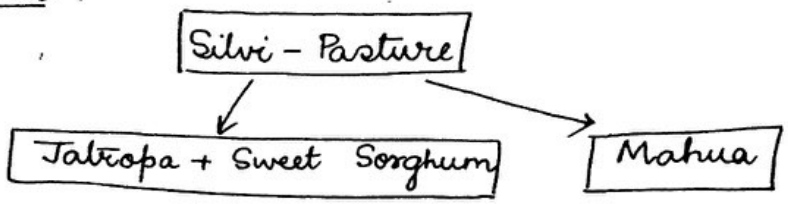
<A> On-farm Activities

<B> Off-farm Activities

In the on-farm component, provision of generating PRIORITY STATUS to livestock is primarily targetted. As fluctuations in precipitation ~~xxxxxx~~ is unlikely to influence livestock yield, except extreme climatic conditions, this is projected to facilitate stability of farm-income for the engaged

farmer removing their economic vulnerability. Simultaneous to it in the off-farm segment, mobilisation of SILVI-PASTURE CULTURE with priority of cultivation of natural stand as Jatropa, Sweet Sorghum and Mahua have been mobilised as either agro-forestary or extension forestary. With the proven utilisation of Jatropa in production of bio-diesel and Mahua in production of alcohol, high economic value is projected to be adding to the farm-income with more consistency, as these natural stand are adapted to prevailing weather vagarities. It also incorporates priority dimension of sustaining productivity of the location as selection of stand in absolute accordance to prevailing climatic conditions along with favourable availability of biotic manure, justifies developing control on growing fragile ecological setup. Highlighted in KVY, dry-land farming regions requires slow diffusion of prover agricultural techniques rather than agricultural experiments (Land-to-land rather than lab-to-land).

Off-farm :



Most pressurised asset = Moisture

BTDB = Very Important

Vidarbha = Drought-prone interiors of MH / Leeward Side

Rajasthan — Grip of heat wave

Social forestary

FCA — 1980 (Forest Conservation Act)

↳ Joint Forest Mgmt. Guidelines under National Forest Policy

{ Farm forestary, Agro ", Recreation " } { Extn. Forestary, Rural Forestary, Urban Forestary } — Total 6 Components of Social forestary

Examples of Crop ecological Zonations

6 Components of social forestary.

SOCIAL FORESTARY

Inclusive agricultural development mobilised in the country based on the realisations of limited influence of first generation green revolution includes social forestary as important constituent. Initiated by department of agriculture in 1976, social forestary program was mobilised with specific objective of making rural dwellers self-reliant in their wood requirement for

heating and cooking purposes. It was implemented to absolutely reflect requirements and aspirations of rural dwellers as identified by them with their own participation. The objectives of social forestary, therefore, included :=

(i) Solving energy crisis in rural areas
(ii) Enhancing the supply of feed-fodder to the animals
(iii) Maximising the use of animal excreta as biotic manure
(iv) Diversifying agricultural yields for the farmers
(v) Sustaining ecological characteristics of rural environment.

These original objectives are commonly categorised as 5Fs :

- FUEL
- FODDER
- FERTILIZER
- FIBRE (CROPS)
- FOOD (RESOURCE)

Implementation of social forestary in its original frame was, therefore, in absolute rural setup. However, by mid-1980s, it was enlarged to involve urban regions as well, involving 6 well-defined components namely :=

(i) Farm Forestary
(ii) Agro Forestary
(iii) Rural Forestary
(iv) Extension Forestary

} - Correlated to 5Fs
- Farm & Agro - similar because of combining crop & forestary

(v) Urban Forestary
(vi) Recreation Forestary

} Not correlated to 5Fs.

Farm Forestary + Agro Forestary → Crop + Forestary (trees)

Rural forestary → Employment (with or without crop)
↳ Mobilisation of big broad areas for employment
↳ Self-sufficiency

Rural forestary cannot be farm forestary bcoz farm forestary does not generate employment

Extension forestary is about employment.

Extension is rural, can be urban.

Urban dwellers do not require 5Fs.

Urban forestary overlaps with extension forestary w.r.t. employment.

<1> FARM FORESTARY

It involves the culture of combining crop & wood within the individual's land holdings. This component targets induction of self-sufficiency among the farmers w.r.t their requirements of wood for basic heating, cooking purposes or development of crude

agricultural implements. With the clear ownership rights, farm forestary proves to be a successful component which, however, excludes maximum of farming population that represents marginal category.

(2) AGRO FORESTARY

This component like farm forestary involves the culture of combining crop & wood towards generating self-sufficiency among the farm dwellers. It, however, involves community land, degraded pastures, fallow land or any other such oper public land within the village for community cultivation of wood or pasture crops, to be sold as commercial commodities with revenue sharing among the producers. Agro forestary therefore, not just involve bigger land areas ~~best~~ and thus having more commercial edge than farm forestary, it involves the clause of EMPLOYMENT making it overlap with rural or extension forestary.

(iii, iv) RURAL / EXTENSION FORESTARY

These components of social forestary primarily

includes contract farming involving Selvi-pasture culture facilitating employment generation as its prime objectives. These components largely involves landless labourers in utilising the community land towards sustaining their livelihood.

- Extension forestary:

Extension forestary component in its target of employment generation is also integrated with URBAN FORESTARY.

(v,vi) URBAN / RECREATION FORESTARY:

Like rural dwellers, urban youth is provided with employment opportunity in maintaining, reviving or generating "Green in Urban Areas". However, unlike rural extension, the urban extension forestary DO NOT involve harvesting of yield. On the other hand, the urban forestary, also referred as recreation forestary, involves cultivation of decorative seasonal flowering plants to enhance the aesthetics of urban environment & bringing greenary to the doorstep of urban dwellers.

Chronologically, social forestary in its preliminary phase (1976 - 1990) involved specific dimension

of Economic Criteria with indiscriminate diffusion of exotic plant Eucalyptous, native of Australia. Standing synonym to preliminary phase of social forestary, Eucalyptus sustained "quick wood supplies" in the rural areas along with enhancing aesthetics of urban areas. Timely realisation in regards to the growth of Eucalyptus as invasive alien plant, the current phase (post 1990s) not just includes selection of stand in any of the forestary component in absolute accordance to carrying capacity of the location but also integration of ecological dimensions (joint forest mgmt. guidelines and REDD+) in the forestary components.