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Historical Analysis of Rural India: Contextualising Implications for Progress of Present Day Villages

Sangeeta Bhattacharyya[1] and KuppusamyPonnusamy[2]

ABSTRACT

India has 6,40,867 villages.The paper examines the typical transformations which Indian farming and rural community hadundergone right from the beginning of human civilization in Indian subcontinent, that is, the HarappanCivilization (3000 B.C) to the Post Liberalization Period which India is passing through since 1991. At a time when Government plans on development of Model Villages, the study highlights certain indicators of Model Village and the changes inthe major three sub indicators over the ages in history in the form of meta analysis leading to inferences. The historical inferences were supported adequately by secondary and primary data. Primary data was collected from four villages in Haryana (Green Revolution Belt) and West Bengal (Non Green Revolution Belt) for comparing socio economic status of villages of two regions. The inferences drawnwere found to provide the basis for setting target of future Indian agriculture forthe next 15 years.

Keywords: Model village, indicators, transitions, indian farming, village markets, meta-analysis

INTRODUCTION

India with a vast stretch of geographical area of 328.74 million hectares supports a population of 1.27 billion of which 68.84 per cent population live in villages(Chandramouli, 2011).Although Indian economy has grown steadily over the last two decades, its growth has been found to be uneven when comparing different social groups, economic categories, geographic regions, and rural and urban areas as revealed from the facts that 75per cent of the poor in India live in rural areas, 65 per cent of small villages do not have access to all weather roads in their vicinity and only 30 per cent of households have access to piped water supply(Ponnusamy *et.al,* 2015). Hence there is a need to develop Indian villages as a whole and agriculture can play the most important role in uplifting villages. Mahatma Gandhi had dreamt of self reliant Model Villages.

The Government and other related organisations do their best to realise the dream of Mahatma once again. The Government of India has initiated "SansadAdarsh Gram Yojana" (SAGY) on 11th October, 2014 in which every Member of Parliament (MP) adopts a village and strives to develop it into a model - 'Model means an ideal village'(GoI, 2014). The efforts made to start developing some villages as Models for Development, will surely be followed by other villages as well. Indian Council of Agricultural Research (ICAR) has launched "MeraGaonMeraGaurav" to promote the direct interface of scientists with the farmers to hasten the lab to land process (PIB, 2015). With surmounting role of Indian villages in the arena of country's sustainability and food security it is time to develop some villages into Models meant to be replicated countrywide.

This needs to be evaluated with certain parameters. Thus it is worth analysing the historical changes which the villages went through to get a better understanding of the parameters of change in rural India to strengthen our future initiatives and get a direction for it.

[1.] Ph.D. Research Scholar, Division of Agricultural Extension, ICAR – Indian Agricultural Research Institute, Pusa, New Delhi - 110012, [2.] Principal Scientist Dairy Extension Division, ICAR – National Dairy Research Institute, Karnal – 132001, Haryana

METHODOLOGY

A study was taken up in ICAR-National Dairy Research Institute to standardise the indicators for a Model Village and the comparative relevance of those indicators. Certain broad indicators were identified. This paper synthesizes the transformations which have occurred in Indian villages with respect to those indicators. It is an attempt to recollect the knowledge of our past in order to shape the future of Model Villages in India. Eighty experts were consulted for identification of indicators and sub indicators for determining a Model Village. Fifty of the experts responded. The experts comprised of extension scientists, field personnel and line department officials in the fields of Agriculture, Veterinary and Fisheries who had firsthand knowledge of situation at village level. The following five broad indicators of Model Village were identified:

- Infrastructural Indicators
- Economic Indicators
- Farming Indicators
- Social Indicators
- Environmental Indicators

Given the targets of Indian Council of Agricultural Research for the year 2030, three sub indicators were chosen under the broad indicators as follows:

- Practice of Agriculture (Farming Indicator)
- Practice of Animal Husbandry (Farming Indicator)
- Village Markets(Infrastructural Indicator)

In order to revisit the evolutionary changes in the scenarios of agriculture, animal husbandry and rural markets in India, the historical timeline was divided into following eight periods:

- Harappan Age (3000 B.C-1500 B.C)
- Vedic Age (1500 B.C-500 B.C)
- Pre-Medieval Age (500 B.C-1000 A.D)
- Medieval Age (1000 A.D-1700 A.D)
- Colonial Period (1700 A.D-1947 A.D)
- Pre Green Revolution Period (1947 A.D-1965 A.D)
- Post Green Revolution (1965 A.D-1991 A.D)
- Economic Liberalisation (1991 A.D-till date)

The meta-analysis qualitative research method was followed in this study. Meta-analysis is a technique for combining the findings from independent studies and drawing inferences from it. The validity of the meta-analysis depends on the quality of the systematic review on which it is based. The process is like synthesis of an inference from particular studies thus leading to a concept of village development process in India as a whole. Extensive review of literature was done on the past developments which occurred with respect to those sub indicators during the eight historic periods. In other words, the changes which those sub indicators have undergone over the ages, were studied and analysed, to draw inferences.

The findings related to the above threesub indicators were tabulated from various literatures. For statistical validation of the historical findings, secondary data available of that period was referred and compared with historical findings. Also four villages were purposively selected to study the present status of progressiveness in Indian villages.

Three villages from the Green Revolution Belt, namely, Budhakhera, Kalvehri and BadarpurSaeed from Haryana and one village named Gilechant of West Bengal which is now a part of the "Bringing Green Revolution to Eastern India" program, were studied for their socio economic status in the context of transformations which the villages went through in the fields of the above three sub indicators chosen.

The differences in socio economic status of the villages were hypothesized to be due to agricultural developments in the area. The primary data was meant to strengthen the historical background.

The number of respondents (key informants) were 120 (30 from each village) and data was collected through Participatory Rural Appraisal method of Key Informant Interview with semi structured interview schedule. The historical findings, secondary and primary data, all were used to strengthen the need for Model Villages and ultimately lead to achievement of targets for ICAR Vision 2030.

RESULTS AND DISCUSSION

Transition in agricultural scenario in India

The review of practices of agriculture revealed that agriculture which has been the main source of livelihood for human beings since ancient times has undergone massive changes over the centuries in terms of not only the use of implements but also crops and varieties grown and technologies introduced.

Table 1: Situation of agriculture in India in different periods of time

Harappan Age	Vedic Age	Pre-Medieval Age	Medieval Age	Colonial Period	Pre green revolution Period	Post green revolution Period	Economic Liberalisation
Harappans used wooden ploughs for agriculture and bullocks for draught purpose. Granaries at Harappa and Mohenjodaro are evidences of presence of storage structures. Crops like bread wheat, barley, rapeseed, gram, peas, sesame, cotton, melon, coconut, lemon, pomegranate were cultivated by Harappans *(Randhawa,1980)*.	The Rig Veda has references of ploughing and using sickle to harvest crops. Barley, sesame, sugarcane, cucumber and bottle gourd were cultivated by Vedic Aryans as per references of Rig Veda *(Randhawa, 1980)*.	During the Mauryan age, in the Ganges Valley, the soil being heavy and loamy, the necessity of heavy iron tipped ploughs and plough-shares was most essential to make intensive agriculture possible *(Randhawa, 1980)*.	Babur introduced the scented Persian rose in India. The Groundnut, tobacco, potato, amaranth, cashewnut, guava, custard-apple, *chiku*, pineapple, chillies, agave and alamanda were introduced by the Portuguese into India who came to India in search of spices but eventually conquered parts of India (1498-1580) A.D. *(Randhawa, 1982)*.	Agricultural implements like steam plough, iron sugar mills and chaff cutter came to be used. Steam threshers were in use in 1907 and reaping machines for wheat were introduced in Punjab in 1908. Notable improvements were done in wheat and sugarcane which led to development of hybrid canes and self sufficiency in sugarcane *(Randhawa, 1983)*.	Provision of quality seeds, improved agricultural implements and techniques, marketing and credit facilities, soil research and manures, development of fruit and vegetable cultivation, arboriculture including of planting of forests were items in CDP (1952) *(Randhawa, 1986*).	The Green Revolution resulted in a record grain output of 131 MT in 1978-79. The HYV cultivation requiring more water led to building of dams and production of hydroelectric power along with growth in agricultural input sector which created employment opportunities and improved the quality of life of the people in villages *(Rena, 2004)*.	The uneven growth rate of agriculture in different regions of India was observed.Export oriented commercial agriculture and secondary agriculture got attention of entrepreneurs. The climate change is posing a big threat to sustainable agriculture. West Bengal, Tripura and Bihar, are lagging far behind. The foodgrain production of India has risen from 176.4 MT in 1990 to 201.6 MT in 2000*(NSSO, 1999)*.

The iron axe and iron ploughshare were invented in Later Vedic Period and the people during this period were well versed with practices like seed treatment and manuring,wheat, cotton & rice seems to be not a part of Early Aryan (1500-1000 B.C) agricultural practices but later they came to know about them from the natives.Paddy cultivation started in medieval age while the Medieval Period saw introduction of crops from outside the country like rose by Babur and groundnut, tobacco, potato, cashewnut, guava, custard-apple, pineapple, chillies etc by the Portuguese. Jute cultivation was started by farmers in Bengal in seventeenth century. The Colonial period saw the usage of agricultural implements like steam plough, iron sugar mills and chaff cutter. Credit facilities in agricultural sector were extended to farmers through Community Development Programme (CDP) and Intensive Agricultural District Programme(IADP). The IADP in 1960 and Intensive Agricultural Areas Programme in 1964 significantly enhanced adoption of good agricultural practices. This

increased demand for chemical fertilizers, plant protection chemicals and farm machines. Rural electrification started with First Five Year Plan boosted construction of tube wells.The Green Revolution which was a turning point for Indian agriculture and also its economy by transforming India from a net importer to a net exporter of food, made farmers to shift from traditional crop varieties to High Yielding Varieties (HYV) and usage of machinery and high value fertilizers, chemicals and also more water which led to a boost in production, employment opportunities and standard of living of farmers in villages. However, there are reports of inequality in advancement of agriculture in states where the benefits of Green Revolution could not reach.

Transition in animal husbandry scenario in India

The status of livestock during different periods revealed that indigenous breeds of cattle were used for milking as well as draught purposes by villagers since ancient times. But livestock rearing achieved a new dimension in Mauryan Dynasty when a Superintendent was there to supervise the herds and stored milk and ghee and a herdsman was hired by villagers to look after grazing of animals. Veterinary service and studies both were facilitated by the State. The Government's role in promoting livestock development was commendable even during Colonial Period in terms of disease management but it reached its peak when Government after independence launched Key Village Scheme (KVS) and National RinderpestEradication Programme(NREP) to focus on Artificial Insemination and disease eradication. Six million breed able cows and buffaloes were served by KVS.

Table 2: Situation of animal husbandry in india in different periods of time

Harappan Age	Vedic Age	Pre-Medieval Age	Medieval Age	Colonial Period	Pre green revolution Period	Post green revolution Period	Economic Liberalisation
The Harappans domesticated humped bull, Indian buffalo, goat, sheep, pig, one humped Indian camel, ass *(Randhawa, 1980)*.	Vedic Aryans were primarily pastoral, rearing cattle which were milked three times a day, sheep and goats were reared for wool and flesh. The Hariana breed of cattle is believed to have entered India through the northern passes with the Aryans *(Randhawa, 1980)*.	In Mauryan villages, Veterinary service was considered essential and veterinary doctors were assigned free endowments of land. Slaughter houses afforded veterinarians anatomical studies. During reign of Ashoka veterinary hospitals were State institutions *(Randhawa, 1980)*.	Kankrej breed of cattle were used for hauling supplies in Mughal army. There are references of buffaloes, goat breeds like Barbari, Surti, Marwari breed of sheep in literatures of sixteenth and seventeenth century *(Randhawa, 1982)*.	Cattle breeding came to be looked upon as a responsibility of the provincial agricultural department and in most provinces the veterinary establishment concentrated upon control of contagious disease *(Randhawa, 1983)*.	Key Village Blocks and Artificial Insemination Centres were established under the Key Village Scheme (KVS) in 1952. The National Rinderpest Eradication Programme (1954), the mass scale vaccination of bovines rendered huge tracts rinderpest free *(Randhawa, 1986)*.	The Operation Flood Programme, launched in 1970, organized dairy farmers' cooperatives in rural areas and linked them with urban consumers, created a strong network for procurement, processing, and distribution of milk over a lakh villages in India.*(Nargunde, 2013)*.	The share of cross breed animals was 13.7 per cent in 2003 than 7.7 per cent in 1992. In arid region farmers had less than 5 per cent Cross Breed cattle, 10.9 per cent in rainfed than 4.9 per cent in 1992 and 14.8per cent in irrigated regions in 2003 *(Kumar and Singh, 2008)*.

It was during 1965 that the Cross Breeding Programmes started gaining pace and spread rapidly at farmers; level in 1970s. 1970s also saw the Operation Flood Programme which led to the formation of Dairy Cooperatives in villages. The efforts of Cross Breeding has resulted in a significant population of farmers preferring Cross Bred cows specially in irrigated regions than arid areas where indigenous breeds can only tolerate the heat.

The History of Agriculture and Statistics

The meta analysis of literature synthesized above can be correlated with the growth in agricultural and allied sector GDP over the years in India which had been very well compiled by Chand and Parappurathu in their work in 2011.They identified five distinctphases of agricultural growth in India as follows:

(i) Phase I: Pre-green revolution Period (1950-51 to 1967-68)

(ii) Phase II: Early green revolution period (1968-69 to 1985-86)

(iii) Phase III: Period of wider dissemination (1986-87 to 1996-97)

(iv) Phase IV: Post-Reform Period (1997-98 to 2005-06)

(v) Phase V: Period of Recovery (2006-07 to 2009-10/2010-11)

The pre-green revolution period (1950-51 to 1967-68) was characterized by steep declinein growth in GDP agriculture, with decadal growth rates found to plummet sharply from 2.78per cent to 1.06 per cent between the period 1950-51 and 1967-68. The green revolution waskick-started from the year 1966 and the effects of adoption of superior technology and institutional reforms were found to manifest from 1968-69 onwards. The subsequent period isclassified as early green revolution period and a visible reversal of growth in GDP agriculturewas observed. The decadal growth rate reached near 3 per cent by the decade ending with1985-86. The period of wider dissemination of technology was characterized by sustainedgrowth in the sector for over a decade peaking at the year 1996-97. The deceleration of growthwas started from 1997-98 onwards and a clear indication of slumping of the agricultural sectorwas visible till the year 2005-06. This slump is widely perceived as an outcome of substantialdiversion of resources away from agriculture to other sectors of the economy. However, asignificant recovery of growth was observed in the last few years that had pushed the decadalgrowth rates above 3 per cent. In nutshell, the growth series reflects sharp deceleration of theagricultural sector in the post-reforms period and an unambiguous turnaround in the last fiveyears, which also happens to be the 11th five year plan period (Chand and Parappurathu, 2011).

Table 3: Trend Growth rates in GDP of various sub-sectors in India at 1999-00 prices, 1950-50 to 2010-11 (Per cent/year)

Phase	All sectors	Agriculture and allied	Agriculture	Non-Agriculture
Pre-Green Revolution	3.71	2.00	1.97	5.42
Early Green Revolution	3.72	2.38	2.63	4.62
Period of Wider Dissemination	5.52	3.57	3.58	6.40
Post-Reforms	6.01	2.08	2.04	7.23
Recovery	8.24	2.62	2.55	9.47

Source: Chand and Parappurathu, 2011

Similarly we can correlate the historical developments in animal husbandry sector with the statistical trends inthe increase in livestock population after Cross breeding Programme was initiated in India at farmers' level which is reflected in the Livestock Census data in the table4 indicating the livestock population increase in India.

Table 4: Livestock and Poultry Population (million nos.) as per 1951, 2007 and 2012 Livestock census in India

Livestock	Livestock Census (1951)	Livestock Census (2007)	Livestock Census (2012)	% Increase / Decrease (2007-2012)
Crossbred cattle	-	33.06	39.73	20.18
Indigenous cattle	-	166.02	151.2	-8.94
Total cattle	**155.3**	**199.08**	**190.9**	**-4.1**

Source: Basic Animal Husbandry Statistics (GOI). 2014

The galloping leap in milk production after Operation Flood and parallel Cross Breeding Programmes as evident from table 5 confirms the historical developments in Indian villages where farmers depend on agriculture and animal husbandry as the main source of their livelihood.

Table 5: Annual compound growth (percent) in output and yield of different livestock species, 1972-1997

Items	1972-97		1997	
	Output Growth	Yield Growth	Output (mt)	Yield (kg/million/annum)
Cow Milk	5.15	3.16	35.51	1085
Buffalo milk	4.41	1.94	35.33	1341

Source: Birthal et. al, 2002

Transition in Rural Marketing scenario

Rural markets have always been an important feature of village economy since ancient times. Large villages or a group of small villages had a market for buying and selling of daily goods. The traders bought and sold those articles which villagers required and were in short supply in the area where market was organized.

Table 6: Situation of village markets in India in different periods of time

Harappan Age	Vedic Age	Pre-Medieval Age	Medieval Age	Colonial Period	Pre green revolution Period	Post green revolution Period	Economic Liberalisation
Public areas for markets were found in front or inside major gateways & in various neighbourhoods at large sites *(Kenoyer, 2006)*.	Village level self sufficiency was prevalent and villages got their requirement through barter system.	In Gupta period, a market was organised in a village or a group of villages, every week or every fortnight where villagers purchased or bartered products of various villages. *(Prakash, 2005)*.	*Mandis* or standard markets were located in large villages that had a 7-10 day periodicity. Small villages had a small shop or two *(Blanton and Fargher, 2008)*.	Due to flooding of foreign goods, village artisans had to depend on merchants for sale of their products in local and distant markets. *(Agnihotri, 2010)*.	Weekly markets and groceries usually supplied most of the requirements of rural families.	The peasant cultivators became farmers for whom agriculture was a calling beyond subsistence. They sold most of their produce in the markets.	Several government schemes including farmers' market (Rythu Bazaar), regulated markets, online trading greatly improved the access of villagers to market by reduced distance, quality of products, timely availability etc. *(http://shodhganga.inflibnet.ac.in/)*

The farmers produced agricultural produce for subsistence purpose and hence accessibility or capacity of market to transact all agricultural produce was not an issue till Pre Green Revolution Period. But with increased production and farmers' agricultural practices oriented towards commercialization after Green Revolution, now the lack of adequate marketing facilities within or nearer to villages for perishable agricultural and livestock produce has emerged as a big challenge for the rural economy. According to the report of Marketing and Research Team (MART), New Delhi on Traditional Haats and Melas in India, a study sponsored by the Ministry of Rural Development during 1995, it is estimated that there are 47,000 haats of which 75 per cent are held once a week, 20 per cent twice a week and 5 per cent are held daily.

The study indicates that, on an average, one haat caters to approximately 14 villages. The relationship between the distribution of villages according to population or range and the availability of haats, smallest villages (population less than 500) held the fewest haats (only 1.6 per cent). Majority of haats (47.9 per cent) are held in big villages (those with a population of over 5000 persons).

Nearly 2/3rd of the village markets are held at a distance of 16 km, 23 percent are held at 6 to 15 km distance and 9 percent within a distance of 1 to 5 km. The amenities and facilities available in these haats are far from satisfactory(shodhganga.inflibnet.ac.in).

Socio Economic Profile of the Villages in Study Area: A Statistical Basis in the Context of Regional Differences of Indian Villages

The socioeconomic status and agricultural and livestock productivity (table 6) of the four villages studied further revealed the stark differences brought about by Green Revolution in the standard of living of Indian farmers.

The information obtained through key informant interviews helped in bringing out the agricultural and socio economic status of the villages.

Table 7: Comparative Socio-Economic Profile of the villages in Green Revolution Belt (Haryana) and the Non Green Revolution Belt (West Bengal) – regional diversity

n=120

Particulars	Budhakhera (Haryana)	Kalvehri (Haryana)	Badarpur Saeed (Haryana)	Gilechant (West Bengal)
Population	2966	2200	3000	2500
Agricultural Productivity				
Wheat	40q/ha	40q/ha	44q/ha	28q/ha
Paddy(non basmati)	30q/ha	32q/ha	32.7q/ha	27q/ha
Potato	80q/ha	-	-	220q/ha
Livestock Productivity				
Indigenous cattle	-	-	6lit/day	5lit/day
Crossbred cattle	10lit/day	8lit/day	10lit/day	8lit/day
Buffalo	4lit/day	5lit/day	5lit/day	-
Average size of land holding				
Upto 1ha	70 % farmers	85% farmers	95% farmers	99% farmers
1-2ha	5% farmers	10% farmers	3% farmers	1% farmers
>2ha	25% farmers	5% farmers	2% farmers	-
Average monthly individual income	Rs. 8000	Rs. 6000	Rs. 7000	Rs. 5000
Average monthly family income	Rs. 30000	Rs. 40000	Rs. 30000	Rs. 10000
Average Family size				
Small (upto 5 members)	90% of households	5% of households	15% of households	75% of households
Medium(6-8 members)	7% of households	93% of households	80% of households	20% of households
Large(>8members)	3% of households	2% of households	5% of households	5% of households
Mode of transport				
Motorcycle	75% of households	90% of households	80% of households	80% of households
Car	10% of households	5% of households	10% of households	1% of households
Auto	10% of households	5% of households		10% of household
Bicycle	5% of households		10% of households	5% of households
Rickshaw	-	-	-	4% of households

The meta analysis of literature stated that Green Revolution resulted in regional differences (NSSO, 1999) and this became evident with the socio economic status and agricultural and livestock productivity (table 6) of the Green Revolution Belt villages which are in Haryana and the one in West Bengal where the effects of Green Revolution were not so vivid. There are differences in agricultural productivity, particularly in wheat in which Gilechant fairs quite low but beats Haryana villages in potato. The average monthly individual as well as family income are low in Gilechant (West Bengal) in comparison to villages in Haryana. About 5 to 10 per cent of households own cars in villages of Haryana as compared to only 1 per cent in Gilechant. Also there are no large farmers in Gilechant whereas large farmers are present in substantial numbers in villages of Haryana. This depicts the regional differences which have already been noted in the historical findings.

Implications of Historical Learning for Future Agriculture

Indian Council of Agricultural Research (ICAR) has already released its Vision 2030 (ICAR, 2011). The meta-analysis stressed on certain needs which needs to be fulfilled for meeting the future requirements in Indian agriculture. The future of rural India rests on development of Model Villages which are not only pioneers in agricultural production but also equipped with modern infrastructure to tap the potential of farming sector. Once farming is made remunerative and a glamorous income alternative then it will be easier to retain youth in farming and ultimately reduce migration and burden on cities. The Model Villages if capable of producing record production of food grains, fruit, vegetables and also livestock produce then ultimately it leads to achievement of future targets.

Table 8: Future requirementsfor sustainable agriculture in India

Parameter	Likely status / Requirement	Inferences from meta-analysis
Likely total population	1.7 billion by 2050	Diversified farm enterprises and crops for food security
Total urban population	70 % by 2050	Self sufficie nt Model V illages which reduces rural youth migration to urban areas
Food requirement	420 million of food production comprising 160 million tonnes of rice from 40 million ha100 million tonnes of wheat from 25 million ha in addition to producing 160 million tonnes from pulses, oil seeds, maize and millets	Need for second green revolution especially from Eastern States to tap the potential of fertile soil and heavy monsoon and also reduce regional disparities.
Vegetables and fruits requirement	300 million tonnes by 2025	Need to shift from rice -wheat cropping system pattern largely followed in Western UP, Punjab, Haryana to intercropping, orchard management and vegetable cultivation during fallow periods, diara cultivation,seasonal vegetable cultivation around banks of water bodies
Livestock production	have to be enhanced to 30, 60 and 80 per cent by the year 2050	Need for mixed farming (crop+livestock) and entrepreneurship which also enhance the income of farmers
Additional job seekers	80 million by 2025	Agripreneurs, commercial farmers, kiosk *sanchalaks*, cyber cafe operators in model villages equipped with IT facilities can be the new self employment opportunities for youth

CONCLUSION

Spanning throughout this historical timeline was the farming and rural life of Indians which has been synthesized through findings in various literatures. It is noteworthy to reflect back how the transformation

gradually occurred in terms of agriculture, animal husbandry and marketing facilities present in rural India during different periods of time.The meta-analysis of literature throws light upon areas of improvement which can ultimately help in achieving the targets of a food and nutritional security as laid down by ICAR vision documents and make the pathway easier for development of self sufficient well equipped Model Villages in India.

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