

DEVELOPMENT AND  
ENVIRONMENT DISCOURSE:  
AN UNDERSTANDING WITH  
REFERENCE TO UTTAR PRADESH

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*Abstract* — The State of Uttar Pradesh is one of the largest in terms of area and population. The State is categorized in various regions; where, East and West Uttar Pradesh are the two critical regions. There is always a debate that the West Uttar Pradesh is a better performer in terms of economy in comparison of East Uttar Pradesh. However, in the late 19th and into the early twentieth, the eastern districts were the more productive agricultural regions of the State. The present paper is based on an analysis of the development debate going on in Uttar Pradesh Vidhan Sabha in the early years after independence. The paper also argues that the network of canal irrigation during the British time-period gave an advantage to the West Uttar Pradesh and that is why the east Uttar Pradesh lagged in the race of progress of development. The paper argues that this economic prosperity on the part of West Uttar Pradesh is not sustainable as it creates several environmental problems and health issues for the people of the region.

**Keywords:** Colonization Scheme, Canal Irrigation, Environmental Problems, Economic Prosperity, East and West Uttar Pradesh

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## I.

The debate of development in Uttar Pradesh may be analyzed in terms of two diversified regions of Western Uttar Pradesh and Eastern Uttar Pradesh. The West U.P. is the area which is portrayed as developed and prosperous. In contrast, the East U.P. is pictured as a more rustic, low on development, inadequate and problematic domain of Uttar Pradesh. But this is no absolute truth as in the late 19th century; East U.P. showed more promising results in comparison to West U.P. It is hardly known that, in the late 19th and into the twentieth, the eastern districts were the more productive agricultural regions of the State<sup>1</sup>. According to the second Human Development Report of Uttar Pradesh, 'the State is divided into four economic regions, namely, Western U.P., Central U.P., Eastern U.P., and Bundelkhand. The first three regions fall in the fertile Gangetic plains, while Bundelkhand lies in the dry Vindhyan plateau. The Western and the Eastern regions are the most populous, with a share of 37 and 40 percent respectively in the State population. The Western region is relatively the most developed region of the State in terms of economic prosperity. Agricultural productivity is higher in this region. The region has a more diversified economy with almost half of the industries in the state are located in this region. East U.P. is officially designated as a backward region. Eastern region is most densely populated with a heavy dependence on the land. It is marked by a low level of diversification, low productivity and low per capita income. Most of the poor in the state are concentrated in this region'<sup>2</sup>.

The west U.P. region mainly comprises of districts of Meerut Division, Agra Division, Rohilkhand Division, Farrukhabad and Etawah districts. The Central part consists of Lucknow division, and the areas of Kanpur, Fatehpur and Barabanki and the east region consists of Varanasi, Gorakhpur, and Faizabad Divisions. The initial investment in irrigation in Uttar Pradesh in the canal systems was made during the mid-nineteenth century. The canals, the Eastern Yumna, the upper and lower Ganga and the Agra canal were built between 1830 and 1880 and covered the Meerut, Rohilkhand and Agra Divisions which, comprise what is now West U.P. It has given a definite advantage to the Western part of Uttar Pradesh in irrigation, and ultimately this has resulted in more agriculture production to the benefit of the farmers. Better development prospects were visible for this part of Uttar Pradesh in comparison to East Uttar Pradesh.

The question is when the Eastern U.P. was more productive and prosperous in the early 19th century, then what are the reasons of the lag behind of east U.P. in comparison to West U.P. What are the reasons for the failure of Eastern

<sup>1</sup> Brass, Paul R. ( 2012) *An Indian Political Life: Charan Singh and Congress Politics* ( 1957-1967), Vol II, New Delhi, Sage Publications, p. 16.

<sup>2</sup> The Second Human Development Report, U.P. <[http://hdr.undp.org/sites/default/files/india\\_uttar\\_pradesh\\_2007.pdf](http://hdr.undp.org/sites/default/files/india_uttar_pradesh_2007.pdf)>.

U.P. later in the course of history. In the whole debate of development why it is so that West U.P. is pictured as the developed frame whereas the East U.P. as the under developed frame. When one searches for the reason for this dichotomy and difference, one needs to understand the debates and discussion going on in the Vidhan Sabha of U.P. in the early years after independence. The distribution of land and the means of irrigation are the critical aspects that have created such differences. The colonial masters come up with a plan for canal irrigation in Uttar Pradesh. This experimentation was done to generate more revenue while increasing the productivity of the agriculture in the regions of Punjab, Haryana and West U.P. First, the Jumna canal and then Ganges canals were initiated in Uttar Pradesh, particularly to the benefit of West U.P. No doubt, later, they experimented with the same canal irrigation in the Eastern part of U.P. also. They took the Sarada canal irrigation project as the last major plan for canal irrigation. The early setting of the canal networks substantially benefitted the west U.P. Still, there are other variables of development which are also equally important as economic development were consciously or unconsciously ignored led to the issues of degradation of the quality of soil, increase in many diseases and environmental issues.

The present paper gets insights from the field-work done in the forest of Lakhimpur Kheri district of Uttar Pradesh. The human inhabitations near the forest area significantly attract the attention of any researcher as they are different than the natives of the land. The two human inhabitants belong to two different regions of India. One, the Sikh, migrated to this land from Punjab and another one that from eastern U.P. belonged mainly to Gorakhpur Division. This attracted my attention, and I searched as from where and in which conditions they have migrated and settled in the land that is marshy and always prone to malaria. I interacted with the inhabitants, but the interaction confined to the younger lot, and that is why the real narrative could not be deduced from their account. That is why I depended on the writings of the scholars and the proceedings of the Vidhan Sabha. From there, the narrative that I derived provided a base to initiate a dialogue with the debate of the development of Eastern and Western Uttar Pradesh. Both these groups are an outsider to this land, and the narratives suggest the status of growth and development of Uttar Pradesh after independence.

Taking the insight from the field-work in the forests of Lakhimpur Kheri, the search for the settlement narratives was taken up. Government of Uttar Pradesh just after independence emphasized upon the development of agriculture land and a plan to distribute the land to the landless and the educated unemployed youth. However, in the chaos of migration that occurred after 1947, there was a considerable influx of Rai Sikhs from Punjab. They took advantage of the disorder at the time to occupy and cultivate thousands of acres of this land in the Tarai area of Nainital district. The skills of the Rai Sikhs in both cultivation and criminal activity, including the use of

force, helped them in land grabbing. Charan Singh has taken note of this, and according to him, they are not at all bona fide refugees, but merely persons who took advantage of the disturbed conditions that prevailed at that time to grab whatever land they could get possession off. Several attempts were made to evacuate the area, but there was no success. According to Charan Singh, the trespass must not be recognized on forest land at all<sup>3</sup>. The will power on the part of Chief Minister and Government to solve the issue was not there; that is why the situation continued as such for an extended period. The Rai Sikhs and Kambohs settled in the Tarai region near Nainital. Charan Singh, the minister incharge of that time believed that: 'Persons who had been settled by the (colonization) department were either not allowed to take possession or have been turned out. He was also of the opinion that 'these persons have never been cultivators'<sup>4</sup>. But chief secretary believed that: 'there was plenty of lands available in the district of Pilibhit and Kheri on which these communities may be settled'. The response of Charan Singh: 'they are the responsibility either of the Punjab Government or the G/I, but none of ours. We have no land to settle them upon. The Lakhimpur Kheri scheme of colonization was meant to provide land to landless persons of Gorakhpur division. The scheme will entail a huge expenditure which I will submit, will be better spent on the poor people of our own State'<sup>5</sup>. But later both the groups, i.e. Rai Sikhs and people from Gorakhpur division settled upon the land.

Narrative two involved an essential scheme of Government of India, adopted by the States to resettlement and rehabilitate the landless poor and educated unemployed. The Lakhimpur Kheri colonization scheme was mainly for the people of then Gorakhpur division, irrespective of any caste group. The Gorakhpur division at that time included several districts of the Eastern part of Uttar Pradesh. Why this scheme was peculiar to East U.P. and other parts of U.P. were not part of the scheme is vital to understand. For this understanding, the debates and proceedings of the Uttar Pradesh Vidhan Sabha are essential to investigate. This investigation has led to indicate the prominence two crucial leaders, one Charan Singh, from west U.P. and minister in the ruling Congress government. He held several important positions and later the Chief ministership of U.P. and Prime ministership of India. The other leader from the Praja Socialist Party representing Deoria district, Mr Genda Singh, a member of Vidhan Sabha. He later became Member of Parliament from Deoria. The debates between the two leaders in Vidhan Sabha regarding the floods of Eastern U.P. has opened different pages of bitterness and perception of the ruling elite regarding the pathetic condition of East U.P. This clearly brings to

<sup>3</sup> Brass, Paul (2011), "Land Grabbing and Land Development in the Tarai" (1952-55) in *An Indian Political Life: Charan Singh and Congress Politics, 1937-1961*, Sage Publications, New Delhi. pp. 238-39.

<sup>4</sup> *Id.*, p. 234.

<sup>5</sup> *Id.*, p. 235.

front the two narratives of development, one advocated by Chaudhury Charan Singh and another by Genda Singh.

## II.

It is commonly accepted and well documented that during this century, West U.P. agriculture has developed more rapidly and has become much more productive than agriculture in the rest of the State. The main reason for this seems to lie in the social fabric of the area. East U.P. has, historically, been dominated by landlords, whereas in West U.P., middle and large peasants are more predominant than anywhere else in the State<sup>6</sup>. Though there is another important point that Paul Brass raises is that; ‘the predominant opposition parties in the eastern parts are all from the left of the political spectrum’<sup>7</sup> in the early years after independence. This political configuration of East U.P. had its impact on the parameters of development.

The debate between the Eastern Uttar Pradesh versus western Uttar Pradesh is not new. Just after independence, this controversy was the matter of discussion in the Uttar Pradesh Assembly. Two prominent leaders, one from Western U.P. and another from Eastern U.P. were involved in the debate regarding the concessions given to the farmers of the East U.P. Charan Singh from Congress Party and Genda Singh from Praja Socialist Party were representing two different regions of Uttar Pradesh. Since Charan Singh was representing the ruling party there was tremendous pressure upon him to satisfy the opposition and that to wisdom-fully and rationally. But the demands were such that it was not possible at a glance to fulfil all. The Praja Socialist Party advocated for the relief to the people of Eastern U.P. and demanded that the area be declared as the “famine area”. The demands were: 1. Opening of cheap grain shop in every panchayat 2. Establishment of test work and provision of assistance for opening cottage industry 3. Free education for students 4. Appointment of a commission to enquire into the economic conditions of eastern districts and to suggest ways and means for their improvement 5. The immediate stoppage of land revenue collection and all other taxes, as well as remission in the land revenue<sup>8</sup>.

According to Paul Brass, the predominant opposition parties were all from the left of the political spectrum. In the eastern districts of the state, the principal opposition parties were all on the political left, including the Praja Socialist

<sup>6</sup> Lerche Jens (1998) “Agricultural Labourers, the State and Agrarian Transition in Uttar Pradesh”. *Economic and Political Weekly*, Vol. 33, No. 13 (Mar. 26 - Apr. 3, 1998), pp. A29-A35, New Delhi.

<sup>7</sup> Brass, Paul R. (2012) *An Indian Political Life: Charan Singh and Congress Politics (1967-1967)*, Vol. II, New Delhi, Sage Publications, p. 4.

<sup>8</sup> Brass, Paul R. (2012), *An Indian Political Life: Charan Singh and Congress Politics (1957-1967)*, Vol. II, New Delhi, Sage Publications, p. 6

Party (PSP), The Socialist Party (S.P.) and Communist Party<sup>9</sup>. It also reflects in the debates and discussion of the Vidhan Sabha of Uttar Pradesh at that time. These debates and discussions indicate the fact that despite better performance in the late nineteenth and early twentieth century, the Eastern U.P. could not maintain the pace and lag behind Western U.P.

During the debate on the issue of giving relief to the farmers of Eastern Uttar Pradesh, certain remarks of Charan Singh caused a difficult situation for the ruling party. Statements of Charan Singh was exaggerated and put in the press account alleged that he had proposed 'migration of surplus population' in the stricken area to the Andaman Islands. Charan Singh responded with a long letter to Pioneer about the statement he has made. He acknowledged his statement in reference to a proposal made by the Government of India (GOI) in 1955 concerning 'settlement of some people in the Andamans'. It was ridiculed by the District Magistrates of Deoria and Gorakhpur. They remarked that, what to say of Andamans, people from their districts were not prepared to leave their hearth and home even for settlement in Lakhimpur Kheri in their own State where a scheme had been launched, designed to absorb one thousand persons from Gorakhpur Division<sup>10</sup>.

The area of the scheme as narrated by Mr Charan Singh in reply to one of the questions raised in the Legislative Assembly: 'The area of the Lakhimpur district is 1603033 Acres, out of this 871868 Acre is forest land, 101027 acre is water, 131928 is a barren land and on 1001128 acres is used for agriculture activities. In this colonization scheme, a total of 688 families are rehabilitated. Six hundred eleven families are landless, whereas 77 constitutes of educated unemployed'<sup>11</sup>. For this scheme, the land from the local farmers was also taken. Nearly eighty farmers have given a total of 3090.08 acres of their land. A total of 4860 acres of land has been distributed to the landless and educated unemployed<sup>12</sup>. But there was no major issue of the displacement of any family or community as those whose land was acquired had a large tract of land and compensation for their land was sufficient for them and there was no resentment on their part regarding this scheme.

'The colonization scheme of Lakhimpur Kheri and Pilibhit aimed at providing land to the landless and the educated unemployed persons. Along with the land, the scheme also incorporates a pucca house of the value of Rupees thirteen hundred only. The educated unemployed were given twenty acres of land and rupees one thousand as loan whereas for the landless the amount of loan

<sup>9</sup> Brass, Paul R. (2012), *An Indian Political Life: Charan Singh and Congress Politics (1957-1967)*, Vol. II, New Delhi, Sage Publications, pp. 4-5.

<sup>10</sup> *Id.*, p. 7

<sup>11</sup> The proceedings of the Vidhan Sabha, Uttar Pradesh, Year, 1957, Session 2, Section 1192, Number 4, Date: 27-2-1958.

<sup>12</sup> The proceedings of the Vidhan Sabha, Uttar Pradesh, Year, 1957, Session 1, Section 186, Number 10, Date: 30-8-1957.

was five hundred rupees along with the land of ten acres. In the case of collective rehabilitation, hospitals, schools, wells for clean drinking water, tube-wells for irrigation, safe management for malaria and establishment of seed bank for the agricultural purpose. These facilities are equally available to the Harijans also<sup>13</sup>. The scheme incorporates any caste and class category of the society which fulfils the conditions laid down, but there is no reservation of any caste, class or religious groups<sup>14</sup>. The scheme was also confined to the residents of the Gorakhpur division, and this is the only criterion to decide the stakeholders for rehabilitation in the colonization scheme<sup>15</sup>. The colonization scheme was also there for the rehabilitation of the criminal tribes or the de-notified tribes. Mr Mangla Prasad while informing the Legislative Assembly in 1957 that a colony was established for the rehabilitation of the denotified tribe in the village Bhatpurva, Lakhimpur Kheri<sup>16</sup>.

“The colonization scheme in Lakhimpur Kheri which was started in 1954-55 for the settlement of landless labour and the employment of the educated unemployed has made considerable headway”<sup>17</sup>. It is a part of the speech delivered by the Governor of Uttar Pradesh where he praised the effort of the government in providing a proper settlement to the landless labourers and employment to the educated unemployed. Governor commended the scheme for the rehabilitation of the landless and educated unemployed, and according to him, the scheme was a great success.

The discussion was going on, and Mr. Surath Bahadur Shah took up the issue. According to him, “this scheme was initiated by in the year 1954-55. You must be aware of the fact that the scheme targets a particular area which I represent. In the Nighasan area, nearly two and a half crore rupees were spent to make the scheme successful. Numbers of small towns are established in the name of ex-ministers, for example, Sampurnanand Nagri, Ibrahim Nagri, Bisen Nagri, Girdhari Nagri etc. The capitalists’ representatives of the ruling party for the votes agreed to procure the sugarcane of the non-reserved area. It was done in the name of the welfare of uneducated, unemployed poor. It is obvious

<sup>13</sup> The proceedings of the Vidhan Sabha, Uttar Pradesh, Year, 1957, Session 2, Section 193, Number 7, Date: 21-3-1958. Dr. Jawaharlal Rohtagi, minister of the concern department is explaining the broad provisions of the scheme to the members of the Legislative Assembly.

<sup>14</sup> On the question raised by Mr. VirendraVerma as to the provision of reservation in the Lakhimpur and Pilibhit colonization Scheme, Mr. Hukum Singh Bisen has answered that there is no such provision of reservation for Harizans in the scheme.

<sup>15</sup> A query was raised by a member regarding the applicability of scheme for all the citizens of the State or it is confined to any particular area depending on the loss due the flood or any other calamity. Mr. Muhammad Rauf Jafari (secretary of the Agriculture Minister explained that the scheme is particular for the citizens of the Gorakhpur division.

<sup>16</sup> On the question of Mr. Rajendra dutta, Mr. Mangla Prasad has provided the information. The proceedings of the Vidhan Sabha, Uttar Pradesh, Year, 1957, Session 2, Section 193, Number 7, Date: 21-3-1958.

<sup>17</sup> The proceedings of the Vidhan Sabha, Uttar Pradesh, Year, 1957, Session 1, Section 182, Number 5, Date: 16-4-1957.

the sugarcane was procured in the name of un settlers, but the profit was taken by the capitalists' representatives who promised a vote bank of 300 voters or above. I am ready to take the names provided anyone from the treasury bench asks for this"<sup>18</sup>.

The way the discussion was initiated by Mr. Surath Bahadur Shah suggests to the fact that everything is not very normal and may be the ruling Government do have some ulterior motive to give benefit to a particular section of people who at that time helping the Government in generating some votes at the time of the election.

The scheme may be summarised in the following points:

1. The scheme proposes to distribute the land to the landless and educated unemployed. The quantum of the land allocated was ten acres and 20 acres and along with this, there was the provision of a loan of Rupees five hundred and one thousand respectively. The one room pucca house was also provided to the beneficiaries.
2. There was no provision for the reservation for any caste group, though all the caste groups were treated equally. The striking feature of the scheme was that it was reserved only for the districts of Gorakhpur Division.
3. The land was surplus on the part of the state, and a portion was acquired from the farmers of that area. It did not cause the issue of resettlement of the local farmers though they were provided with some compensation.

### III.

'The irrigation policy of colonial India was directed towards the rationalization of two aims: 1. To protect against famine; and 2. To produce a profitable return on investment by giving priority to works designed to enhance the productivity of the most highly cultivated regions'<sup>19</sup>. 'Since the motive was the profit generation without the consideration of the natural conditions being taken into account, the canals which were designed to remedy the imbalances of nature in effect compounded them. Irrigation succeeded profiting agriculture and thereby Government where natural conditions of adequate drainage permitted it: but where natural conditions did not allow it the costs of

<sup>18</sup> *Id.*, p. 177, this is in Hindi, translated version is presented here.

<sup>19</sup> Whitcombe, Elizabeth (2001), "The Environmental Costs of Irrigation in British India: Waterlogging, Salinity and Malaria", in David J. Arnold and Ramchandra Guha, ed., *Nature, Culture, Imperialism: Essays on the Environmental History of South Asia*, New Delhi, Oxford University Press, p. 238.



irrigation were written on the landscape and in the records of public health: waterlogging, salinity and malaria<sup>20</sup>. The cost imposed by physical conditions of climate and terrain were not only financial but also environmental: but the environmental costs of waterlogging, salinity and malaria, while documented in detail, were never satisfactorily entered in the irrigation account<sup>21</sup>.

According to George Blyn, who reviewed the study of Whitcombe explains the issue as: “if the driving principle behind the construction of the canals was the achievement of increase, without which no real prosperity could be envisaged, this aim was certainly realized, even if its exact measure remains out of reach”. But at what cost, she asks, was the increase achieved? Excessive water use raised water tables and caused waterlogging of soils and crop destroying concentrations of salts and soluble minerals in the upper soil layers; leakage from main channels and obstruction of natural drainage by canal embankments caused swamping and spread malaria; increased frequency of cropping drained soil fertility; cultivation of former wastelands reduced supplies of grass and firewood to the detriment of cattle and soil fertility, because of increased use of manure for fuel rather than fertilizer; well irrigation, more costly but more dependable, especially in periods of low rainfall, was discouraged and many wells abandoned; and, perhaps worst of all in the author’s view, the canals expanded commercial crop production at the expense of the coarse, generally consumed food grains-wheat output also increased, but wheat was not a common food for cultivators<sup>22</sup>.

Government appointed in 1901 an Irrigation Commission which was presided over by Sir Colin Scott-Moncrieff. The Commission submitted its report at Lucknow on April 11, 1903. For purposes of the survey, the Commission divided U.P. into four nearly parallel strips. At the time the Commission reported, there existed four productive canals. The Commission favoured the diversity of waters of Sarda into Ganges and Jumna, even though the proposal was fraught with difficulties<sup>23</sup>.

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<sup>20</sup> *Id.*, p. 239.

<sup>21</sup> *Id.*, p. 246.

<sup>22</sup> Reviewed Work(s): Agrarian Conditions in Northern India. Vol. 1, the United Provinces under British Rule, 1860-1900 by Elizabeth Whitcombe Review by: George Blyn Source: Economic Development and Cultural Change, Vol. 23, No. 2 (Jan. 1975), pp. 367-371 Published by: The University of Chicago Press Stable URL: <<https://www.jstor.org/stable/1152993>> Accessed: 17-4-2020 8.14 UTC.

<sup>23</sup> Sharma, S.R (1975) Irrigation, in V.B. Singh, ed., *Economic History of India: 1857-1956*. New Delhi, Allied Publications Private Limited. p. 166, accessed on 20-4-2020. <[https://books.google.co.in/books?id=xJEXFnGS6AC&pg=PA59&source=gbs\\_toc\\_r&cad=3#v=onepage&q&f=false](https://books.google.co.in/books?id=xJEXFnGS6AC&pg=PA59&source=gbs_toc_r&cad=3#v=onepage&q&f=false)>.

**The Canals of United Province<sup>24</sup>**

Province	Canal	Year of Construction
United Province/Uttar Pradesh (U.P.)	Eastern Jumna Canal	1831
	Ganga Canal	1856
	Agra Canal	1875
	Lower Ganga Canal	1880
	Betwa Canal	1893
	Ken Canal	1909
	Sarda Canal	1930
	Extension of Sarda Canal	1975

When a proposal for a canal was first mooted in the 1870's, it was opposed by the taluqdars in Oudh who were satisfied with things as they were. It was only after the severe droughts and famines of the late nineteenth century and the consequential agrarian unrest that the taluqdars relented. Thus the Sarda canal, covering mainly the central region, was eventually completed in 1926. But it is interesting to note that this canal was, and still is, regarded as protective rather than productive. In other words, the motivation behind its construction was for protection against drought (and hence famine) rather than to enhance production<sup>25</sup>. The experimentation done in the Central and later extended to Eastern part of Uttar Pradesh with reference to canal irrigation in these areas but that was motivated not by the increase in production and high growth but by the prevention of hunger and famine in this part of the Uttar Pradesh. It has resulted in a preposition where the experimentation concerning agriculture did not result in proper growth.

After independence, the agriculture of the west and Central regions was highly dependent on canals for irrigation while the eastern region was even more dependent on sources other than canal<sup>26</sup>. Thus the main difference, prior to 1965, between the west and the east region lay not in the coverage of irrigation but in the differences in the source of irrigation. Whereas in the west, over half of the irrigated area was served by canal, in the east nearly 90 per cent of the irrigated area was served by wells and other traditional sources such as tanks, ponds, and lake<sup>27</sup>.

The Government first took the initiative in installing tube-wells in the 1930s after the installation of hydroelectric generation at the head of the Ganga

<sup>24</sup> *Id.*, p. 175.

<sup>25</sup> Clift, Charles (1977), "Progress of Irrigation in Uttar Pradesh: East-West Differences". *Economic and Political Weekly*, Vol. 12, No. 39 New Delhi. URL: <<https://www.jstor.org/stable/4365953>> Accessed: 25-4-2020 4.46 UTC, pp, A83-A90.

<sup>26</sup> *Id.*, p. A84.

<sup>27</sup> *Id.*, p. A84.

Canal. The first drillings were made in Meerut and Rohilkhand divisions of Western U.P. of the tube-wells operating in 1951, 96 per cent were in the western region<sup>28</sup>. State investment in tube-wells has tended to follow the same pattern as state investment in canals, although the disparities are not so great and the initial regional concentration was soon sought to be corrected after independence. In addition in the eastern region, the smaller holdings, higher rainfall, a less water intensive cropping pattern (in rabi), and the low economic resources of cultivators, have tended to make the running of the tube-wells and full utilization problematic in eastern areas<sup>29</sup>. In agriculture, at present 48% of all land-holdings are smaller than a half hectare in size. The average size of these holdings is less than a quarter hectare<sup>30</sup>.

The tube-well development and the adoption of high-yielding varieties that was done in West U.P. could not be imitated the East Uttar Pradesh. It depends after the initial stage on the generation of resources by cultivators, the access to credit, the repayment capacity of the cultivator, which for various reasons are deficient in East U.P.<sup>31</sup>.

The public investment in canals in the 19th and early 20th century and in tube-wells in the last 40 years has been concentrated in the western region, although this concentration has been largely corrected in the case of public tube-wells. Latterly, projects such as the Gandak (in Gorakhpur and Deoria in the eastern region) and the Sarda Sahayak (in the central and eastern regions), to improve and extend the area under canal irrigation, have been undertaken, and these will tend to correct the regional concentration of canal irrigation. The socio-economic conditions, in terms of population density, size of holding, the inherited agrarian structure, and access to credit, have placed the eastern and (to some extent) central regions in an unfavourable position relative to the western region. The environmental factors, primarily rainfall but also the accessibility of groundwater and the proportion of alkaline and saline soils have slowed down the development of tube-well irrigation in the eastern region<sup>32</sup>.

#### IV.

The development and the agencies of development are in unity with one another. It has resulted in a positive outcome, and it is very accurate regarding

<sup>28</sup> *Id.*, p. A84.

<sup>29</sup> *Id.*, A85.

<sup>30</sup> Panagariya, Arvind (2020) "Covid Crisis Also An Opportunity: Small isn't Beautiful for Indian Workers. Grow the 'Medium' Sector of MSMEs". New Delhi, *The Times of India*, April 29, 2020.

<sup>31</sup> Clift, Charles (1977), "Progress of Irrigation in Uttar Pradesh: East-West Differences". *Economic and Political Weekly*, Vol. 12, No. 39 New Delhi. URL: <<https://www.jstor.org/stable/4365953>> Accessed: 25-4-2020 4.46 UTC, p. A89.

<sup>32</sup> *Ibid.*, p. A89.

canal irrigation initiated by the British for the rapid production in agriculture to generate more revenue. It has resulted in more production and resources. There are certain external conditions which no one provides attention to as the impact of these externalities is always less in comparison to the gain generated by the rapid development. It is genuine for the canal irrigation initiated by the British.

‘Most of the works were financed by loan capital. Hence in the sanctioning of constructions, the emphasis was necessarily placed on the prospect of their remunerativeness. The procedure, however, failed to guarantee financial success. The canals as a whole did not pay until the early 1920s completed the hugely profitable Punjab systems<sup>33</sup>. Policy, dictated so largely by remunerativeness, determined that the engineers should concentrate their attention on the aspects of irrigation which paid. Irrigation succeeded profiting agriculture and thereby Government – where natural conditions of adequate drainage permitted it but where natural conditions did not allow it the costs of irrigation were written on the landscape and in the records of public health, waterlogging, salinity and malaria<sup>34</sup>.

‘The Ganges canal enhanced the natural advantages of the Meerut division but south-east from Aligarh, the chronicle of poor drainage, waterlogging, salinity and fever reappeared. By 1866, twelve years after opening, sixty-six drainage cuts had been made in the canal. But wherever rains were more than moderate – on average, two in every five years waterlogging recurred, and with it malarious fever. The canal irrigation disturbed the moisture and salinity of soil and ultimately the environment. The trend regarding the mortality rate in U.P. in a good year, in which the principal cause, the fever rate was low ranged from 15 to 22 per mille. In years of excessive rainfall, 1885, for example, mortality shot up to 38.9 per mille. The year 1894 and 1908 were the epidemic year for the State and mortality rate was highest in the submontane and the western central canal irrigated districts<sup>35</sup>.

The canal provided more water for the fields in the best of times but led to the abandonment of wells as an alternative source of irrigation. More water could mean excessive water, too, and this caused flooding, swamping, and an increased incidence of malaria in some areas. It tempted the villagers to concentrate on growing more lucrative commercial crops at the expense of food grains. The result was that a failure of rains could cut off the supply of the peasant’s own food and the fodder for his animals and make him starve despite the prospect of a valuable harvest of indigo and sugarcane later on in the

<sup>33</sup> Whitcombe, Elizabeth (2001), “The Environmental Costs of Irrigation in British India: Waterlogging, Salinity and Malaria” in David Arnold and Ramachandra Guha, ed., *Nature, Culture, Imperialism: Essays on the Environmental History of South Asia*. New Delhi, Oxford University Press, p. 238.

<sup>34</sup> *Id.*, pp. 239-40.

<sup>35</sup> *Id.*, p. 253.

season. That the lure of the market led to over-cropping and exhaustion of the soil was noticed at the time. What, however, was not grasped soon enough was how the land was being irrevocably ruined by the very element that was supposed to keep it productive, namely, canal water itself<sup>36</sup>.

In another study reported in *Business Standard* by Bibek Debroy argues that 'in the villages irrigated by the Jumna canal, the standard of health and vitality is materially lower than elsewhere. Dr. Taylor showed clearly the presence of an unusual amount of spleen disease, and its close connection with the degree of swampiness and want of drainage found in various parts. The villages enjoying the greatest advantages of irrigation were almost invariably those where the debilitating disease assumed its most prominent form. Besides fever, the Zamindars of the canal villages complain that copious irrigation of the land brings with it, though they do not know how impotence in men. Dr. Taylor heard that sexual incapacity existed greatly among men but that women were not barren in the same proportion. The two reasons were assigned to this trend; first, the women come from other villages, often villages not irrigated by canals, and so have a healthier stock, to begin with. Second, they work more than men. This sounds strange and is only half true, but there is no doubt that the women in the canal villages look less lazy and demoralized than the men, who are indeed a very degenerate race'<sup>37</sup>.

Reh (alkali) Commission was constituted under the chairmanship of Mr. H.S. Reid for the Aligarh district of northern India. 'The investigations of the committee all point in one direction viz., that the introduction of canal irrigation is the principle cause of alkali extension and that when the removal of soakage water takes place almost exclusively by evaporation, irrigation by canals must end in a destructive crop of alkali where the indigenous resources of the ground in that way were comparatively harmless. As a remedy, the members of the committee almost unanimously proposed deep drainage and great importance was attached to keeping the natural drainage of the country open'<sup>38</sup>. It is apparent that alkalinity, once fairly developed, can never be cured under existing conditions of water level and the same is doubtless true of malarious fever. The primary conditions of alkalinity and fever may be expressed as defective water circulation, though mere surface drainage is ineffectual for the removal of alkali<sup>39</sup>.

<sup>36</sup> Guha, Ranajit (2010), "The Agrarian history of Northern India", in Partha Chatterjee ed. *The Small Voice of History: Collected Essays*. New Delhi, Permanent Black, pp. 119-20.

<sup>37</sup> Debroy, Bibek (2018), "What Delhi Looked Like in 1883-84" New Delhi, *Business Standard*, Friday, 21-9-18.

<sup>38</sup> Powel, J.W. (1890-91) Twelfth Annual Report of the Director of the United States Geological Survey, Volume 12, Part II, Irrigation. Washington Government Printing Office 1891. The Library of the University of California, Riverside, pp. 421-22. <[https://books.google.co.in/books?id=sNJRAQAAMAAJ&pg=PA422&dq=ganges+canal+\(+1856\)affected+district&hl=en&sa=X&ved=0ahUKewjFvx6Rm\\_roAhVEAXIKHYBsCkEQ6AEIKDAA#v=one-page&q=ganges%20canal%20\(%201856\)affected%20district&f=false](https://books.google.co.in/books?id=sNJRAQAAMAAJ&pg=PA422&dq=ganges+canal+(+1856)affected+district&hl=en&sa=X&ved=0ahUKewjFvx6Rm_roAhVEAXIKHYBsCkEQ6AEIKDAA#v=one-page&q=ganges%20canal%20(%201856)affected%20district&f=false)>.

<sup>39</sup> *Ibid.*, 422.

When the Sardar canal project was proposed, it was opposed on the ground that it would cause deterioration in the condition of the soil, as the Jumna and Ganges canals had done, through waterlogging and salinity, and disease would follow in its train<sup>40</sup>. But the policymakers at that time initiated with the project despite several issues and problems.

The repercussions regarding the utilization of groundwater for irrigation along with the canal irrigation shows some disturbing trend and suggests that the development is not at all sustainable. The state of groundwater development in Punjab, Rajasthan and Haryana have reached unsustainable levels while Tamil Nadu, Gujarat and Uttar Pradesh are fast approaching that threshold. The number of unsafe districts has increased from 33 in 1995 to 178 in 2004. Nearly half of the districts of Uttar Pradesh are also in the unsafe category. The State of U.P. is the largest user of groundwater resources. Region wise the maximum with drawl is from the western region covering thirty districts<sup>41</sup>.

Over the last three decades, the groundwater scenario in the state has completely changed, and this has led to a stage of 'hydro-ecological stress'. Nearly 659 blocks are affected, and 179 blocks from 43 districts are categorized as stressed<sup>42</sup>. A majority of the districts and blocks are from the western area of the state.

Serious problems have arisen in the Indo-Gangetic Plain because of the distorted ratio of the application of nitrogen, phosphorus, and potassium (NPK) for generating more production of the crops, a practice that was initiated with the experimentation of green revolution during the decade of 1960. There has been excessive use of nitrogen with adverse effects on soil fertility. The consequence is soil nutrient depletion is a significant cause of the stagnation of rice yields<sup>43</sup>.

Another severe problem emerging from heavy applications of nitrogen in rice and wheat is the contamination of groundwater. Nitrate cannot be removed once it has entered the underground water system. A sustainable combination of organic and chemical fertilizers along with the crop rotation is the requirement of the time<sup>44</sup>. The farmers who are involved in farming activities must be informed about these developments and the remedial measures. The threats

<sup>40</sup> Whitcombe, Elizabeth (2001), "The Environmental Costs of Irrigation in British India: Waterlogging, Salinity and Malaria" in David Arnold and Ramachandra Guha, ed., *Nature, Culture, Imperialism: Essays on the Environmental History of South Asia*. New Delhi, Oxford University Press, p. 258.

<sup>41</sup> Suman Lata (2011), *Irrigation Water Management for Agriculture Development in Uttar Pradesh*, India. Springer, Switzerland, p. 7.

<sup>42</sup> *Id.*, p. 8.

<sup>43</sup> Reddy D. Narasimha and Srijit Mishra (2011), "Agriculture in the Reforms Regime" in Reddy D. Narasimha and Srijit Mishra ed., *Agrarian Crisis in India*, New Delhi, Oxford University Press, p. 11.

<sup>44</sup> *Id.*, p. 11.

that have emerged up due to our over-use of nature through agriculture may cause in the long run an unsustainable life cycle for the people.

## V.

The argument and counter-argument regarding development have to be contextualized in terms of economics, politics and environmental perspectives. In Uttar Pradesh, the politics and economics of development centred on east and west and in the debates and discussions, East Uttar Pradesh was always portrayed as the less developed and economically less prosperous. This regional division of Uttar Pradesh in the context of development has other connotations that were ignored in the whole discourse and discussions by the scholars, and one such dimension is the dimension of the environment.

The agriculture development in Uttar Pradesh has intensified the human activity on the land, this has led to the emergence of several environmental concerns, and this is very true for the West Uttar Pradesh. Use of canal water, growing food on the same piece of land many times in a year lead to deterioration of land quality. It has produced environmental pollution that affected the production as well as the health of the people of that area. The farmers attempt to maximize the use of canal water, the chemical fertilizers and genetic engineering for more products may be seen as a solution to sustainable agriculture, but it proves counter sustainable to the whole process. The development in terms of economy leads to several desirable outcomes. Still, along with these desirabilities, some other striking consequences subvert these desirable outcomes, for example, the prosperity brought about by the canal irrigation in Western Uttar Pradesh caused many environmental issues and challenges at present.

One thing should be evident that without some form of public intervention to regulate the use of fertilizers and utilization of groundwater, we are unlikely to achieve the socially optimal level of environmental pollution control. Achievement of a clean, eco-friendly environment has a cost, and the people must realize that if they want to use the resources for an extended period, they must control their practices of agriculture following nature. The threats demand that we must develop a new sensibility regarding human activities and its sustainability with nature.

The comparison of East and West Uttar Pradesh in terms of the economy has always perceived West U.P. as a better performer in comparison to East Uttar Pradesh. This perception may be accurate regarding the various indicators of development as has also been highlighted the Second Human Development Report, U.P., which was published in 2008. The report holds that agriculture along with the industrial development in the West U.P. is the main reason for the prosperity. But there is another perception along with this, and

that is the perception from the side of the environment. Several studies mention that the economic prosperity of the West U.P. is also bringing the quotient of environment degradation.

Therefore, any regional model of development is not solely dependant on the economic prosperity but on the fact that whether this development is sustainable concerning the forces of nature. The West U.P. no doubt excels in the race of development. Still, along with this, it is also facing a tough environmental challenge in terms of salinity of soil due to canal irrigation, excessive use of nitrogen with adverse effects on soil fertility, soil nutrient depletion which caused of the stagnation of food grains yield. These environmental issues are also causing many health hazards for the people of the region; therefore, the economic growth and development have to take in its fold the natural and environmental factors in the long run.