



# **JOURNAL OF INDIAN RESEARCH**



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# **Journal of Indian Research**

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# CHAIRPERSON'S MESSAGE

In the last one year, due to some technical reasons we could not publish JIR on regular quarterly interval, so now we have come up with combined volume of the Journal of Indian Research for the year. We extremely regret for interruption.

The current issue of the Journal of Indian Research (JIR) has variety of thought-provoking papers from interdisciplinary areas ranging from engineering, management, and social issues. We have been receiving quality papers from dozens of Institutions, organizations, Universities from India & abroad.

Journal of Indian Research (JIR) is the flagship journal of the Mewar University, featuring articles that advance the empirical, theoretical, and methodological understanding of education and learning. It publishes original peer-reviewed analyses that span the field of research across all subfields and multidisciplines.

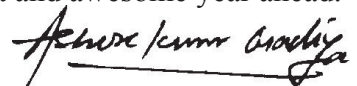
JIR welcomes submissions of the highest quality, reflecting a wide range of perspectives, topics, contexts, and methods, including interdisciplinary and multidisciplinary work. JIR's success depends in large part on the expertise and goodwill of its valued reviewers, who give their time to ensure the journal, continues to publish the very best papers in educational research from around the world.

We welcome the opportunity to expand our reviewer community and invite colleagues with an interest & expertise in their subject to reviewing research paper. Readers are encouraged to send commentaries, comments, and evaluative book reviews.

JIR seeks to encourage a scholarly exchange between researchers from any field of study and will include both theoretical and empirical articles, with priority being given to high quality theoretical and empirical papers that have managerial or public policy orientation as well as ramifications for entrepreneurship research. It is dedicated to furthering knowledge in the application of information technologies to human organizations and their management and, more broadly, to improving economic and social welfare.

We are thankful to global thinkers, academicians, scientists and research scholars for contributing their valuable research papers. Main vision of the Mewar University and JIR is to establish an interdisciplinary research environment, commitment to provide quality research and innovation.

On behalf of the Board of the journal and Mewar University, I extend my New Year greetings to all of you. We look forward for a vibrant and awesome year ahead.

  
Dr. Ashok Kumar Gadiya

## EDITORIAL

Interruption is never intended. Interruptions occur as it is in the nature of flow. Without interruptions, there cannot be connections. This Journal was taking proper shape and igniting interest in holistic thinking and suddenly it was caught up in a lull. But, we are back with renewal and hope. New editorial team is extremely proficient. We have decided to fill up the gap with ‘fusion’ of issues. Thus, all the four issues have been combined in this volume. We hope to publish the regular quarterly issues from this year onward.

The current issue covers several disciplines. Professor K.K. Mandal has written a meticulous paper on *Elephants and Kingship: A Study of the Arthaśāstra*. He argues that the deployment of elephant was deeply embedded in Indian kingship. Elephants are large in size, and appear as a sign of military prowess of the king. The display of war elephants in the royal procession was their reflection as repertoire of Indian kingship. Elephant comes to be deeply embedded in Indian kingship in the later Vedic period c. 1000-500 BCE by the end of which the new culture of war had become universal in North India. By c. 500 BCE the new material and social situation led to the rapid development of such state organs as army and taxation system. No doubt possession of elephant gave an edge to the Magadhan monarchy. The invention of war elephant was in all likelihood an invention of kingship.

We have a paper on archaeological findings in Bihar. Dr. Anil Kumar of Viswa Bharati, Santiniketan’s paper is on his recent finds of a Buddhist site at Krimila Adhithana, an early medieval religious-cum-administrative centre. The site is located in the area around Lakhisarai, a modern town and districts headquarter of Bihar. The author has argued about a possible Buddhist stupa at the site. Prof. Ren HuiLian and Ajay Krishna from the Northwest University, Xi’an, China have argued about the benefits of the OBOR in their paper “*ONE BELT ONE ROAD*” *Initiative of China and Indian Perspective*. The authors have argued that India and China has had more than two thousand years of civilizational tie-up which makes them unique in whole of human civilization. The formidable Himalaya has not stopped establishing a deeper cultural and humane relationship between these two countries and have mutually affected in many ways. China and India are countries as put by famous cultural ambassador between India and China Ji Xianlin as “*created by heaven and constructed by earth*” (天造地设), which wielded considerable amount of mutual influence not only in their mainland region but also in whole of Indo-China region. Most of the Southeast Asia has been the product of mingling of these two civilizations. India must seize this golden opportunity to contribute in the making of new Asia. We have scholars from Tribhuvan University, Nepal and University of Dhaka in Bangladesh contributing their

papers. Thus, the canvass of the current issue is pan-Asian.

We have some interesting papers from young scholars of Mewar University. There are contributors from Delhi University and Central university of Gujarat, from Tamil Nadu and from Himachal Pradesh. JNU scholar Lobzang Chosdup analyzes the interplay of religion and politics in Ladakh. He argues about the changing role of religion in politics, the emergence of confrontation between politicians and monks as well as change of LBA's (Ladakh Buddhist Association) role from politics to more religious and social work.

What Lobzang Chosdup writes about Ladakh is also evident in other parts of Afro-Asia. Interplay of religion and politics is building rising crescendo among the bulging youth population. The conflict of ideas can be resolved only through rigorous exercise in achieving fusion of perspectives. Critical rational discourse based upon observable facts or logical inference can be the proper tool. Academicians have this onerous duty to expand the field of inquiry and infuse the things and events with critical gaze. Intricate problems require simple solutions. Multidimensional approach always spring surprises with umbrella solutions. We have been persistent in appreciating the multidimensional approach towards learning and also expanding the horizons with each new issue of the journal.

The volume is truly multidisciplinary in nature and pan-Asian in expanse. We extend our gratitude to the Chairman of the Mewar University for providing all possible support to continue to publish the journal. When plethora of research journals are mushrooming, many of them finding space in the Beall's list of predatory journal, we have come a long way to promote and publish substantial research as also to encourage scholars from distant corners of the country to compete with the best in contributing their research. It is not the citation factor and other marketed criteria that makes a publication credible. It is the joint effort of the management, editorial team, passion of the scholars and the patience of the readers which make wisdom to bloom in the muddy academic water. May the constant support of scholars enrich the forthcoming issues further and the Journal of Indian Research grows into a banyan tree for scholars of all hue.

**— Niraj Kumar**  
Honorary Editor

# ELEPHANTS AND KINGSHIP: A STUDY OF THE ARTHAŚĀSTRA

**Dr. Krishna Kumar Mandal\***

## ABSTRACT

*The deployment of elephant was deeply embedded in Indian kingship. Elephants symbolize wealth and power. Elephants are large in size, and appear as a sign of military prowess of the king. The display of war elephants in the royal procession was, after all, the display of war assets. It was reflection of war elephant as repertoire of Indian kingship. The paper attempts to explore the trajectory of relation of kingship and management of elephants as reflected in the Arthaśāstra. The text provides the ethnography of war-elephant management and deployment for battle in the over-all structure of kingship. The text refers about establishment of the elephant forest on the border of the state and the connection between elephants and the state. The text provides detailed information on the state hathisār and concerned breeding experts. The Arthaśāstra underlines that victory (in battle) for a king depends primarily on elephants. The invention of war elephant was in all likelihood an invention of kingship.*

**Keywords:** Arthaśāstra, Caturanga, danda, Gajaśāstra, hastivyūha, Hastyāyurveda, Kauṭilya, Magadha, Mātangalīlā, Megasthenes, mrgahastin, raj-vahana, Ṛgveda, saptāṅga.

## INTRODUCTION

Taxation system and standing army are two important sources of Indian kingship. One cannot imagine state without taxation system and standing army. In any case the maintenance of a large professional army was made because of a well-organised taxation system just as the collection of taxes was facilitated because of a coercive authority. This interconnection is stressed by Kauṭilya.<sup>1</sup> In the Mauryan times we witness an unprecedented expansion of the economic activities of the state. The distinguishing feature of Mauryan economy is the state control of agriculture, industry and trade, and the levy of all varieties of taxes from the people. Evidently the state was in dire need of a great amount of surplus in kind and cash which had been rendered necessary for several factors. The large army was essential to keep the peasantry

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of a vast empire under subjection, for the *Arthaśāstra* speaks of the wrath of the people or *prakṛtikopa* (प्रकृतिकोप). It was also needed to defend the different parts of the far-flung empire, but all this would mean terrific economic strain, which could not be met without finding new sources of income. The Mauryans followed the policy of maintaining sufficient surplus in the treasury against emergencies. The normal taxes were not considered sufficient to meet all the needs of the state, and hence the state undertook and regulated numerous economic activities, which formed profitable sources of income to it.

These enterprises necessitated large standing army. Kaṭilya was fully conscious of the importance of force (*daṇḍa*). He points out how the earth is acquired by means of treasury and *daṇḍa*. The *Arthaśāstra* enumerates seven elements (*saptāṅga*) of the state such as *swāmī*, *amātya*, *janapada*, *durga*, *kośa*, *daṇḍa* and *mitra*, suggesting thereby *daṇḍa* is an important element.<sup>2</sup> This element of *danda* consists of soldiers comprising infantry, chariots, elephants and cavalry. This indicates how the deployment of elephant was deeply embedded in Indian kingship. At the same time elephants symbolize wealth and power. Elephants are large in size, and appear as a sign of military prowess of the king. The display of war elephants in the royal procession was, after all, the display of war assets. It had effects upon other kings who were always assessing the strengths of the various assets of their neighbours. It was reflection of war elephant as repertoire of Indian kingship. From this angle, the paper attempts to explore the trajectory of relation of kingship as reflected in the *Arthaśāstra*.

Elephants have attracted kings as vulnerable resources for royal projects virtually from the beginning of kingship. Through spectacular hunts, capture and display in menageries, tribute extraction, and the like, royal ownership of elephants symbolised the primacy of king. The war-elephant was not the first of those royal uses of the elephants, rather it had a long prehistory.

With the emergence of kingship in c. 1000 BCE, the war elephant was invented. The nature of kingship was transformed in c. 1000 BCE. Rites such as chariot race, cattle-raid and game of dice were intended to demonstrate the supremacy of the royal candidate over his kinsmen and the territory.<sup>3</sup> The song of election from the *Atharva Veda* wishes that the *rāṣṭra* or the territory to be held by the king and be made firm by the King Varuṇa, the god Brhaspati, Indra and Agni.<sup>4</sup> In later texts the very fact of performing an elaborate coronation ritual called *rājasūya* suggests a fixed place. The Kuru-Pāñcāla country, the place where the royal power was situated came to be known as the capital (*āsandīvat*). In the *ratnahaviṃśi* ceremony the king had to approach dignitaries who lived in permanent dwellings. Several coronation formulas represent the king to be conscious of the territorial aspect of his position. These are symptomatic of the new character of chiefdom or kingship. Though coronation rituals recall the original election of the king, the *Aitareya Brāhmaṇa* prescribes formula securing kingship for one, two and three generations.<sup>5</sup> A formula from the *satapatha Brāhmaṇa* extends it to ten generations.<sup>6</sup> We also come across the term *rājaputra*, which can be interpreted as king's son in many cases. Thus, kingship or chiefship had become hereditary in this period. The *Śatapatha Brāhmaṇa* mentioned *senānī* heading in the list of *ratnins* suggesting thereby that the army emerged as an important element towards the end of the Vedic period, a fact also supported by the inclusion of the makers and drivers of the chariots in the list of *ratnins* however, at this stage the army was confined to the kinsmen.<sup>7</sup> These references indicate that

the war elephant was invented with the emergence of kingship and warfare in early India. It seems that the techniques of capturing and training them were invented under the auspices of kingship in the later Vedic period, however, A.L. Basham suggests it was little used in war in the period,<sup>8</sup> and were diffused within India and the war elephant quickly became an important asset in early Indian state.

The Indus civilisation is the most important precursor of the invention of the war elephant in the later Vedic period but the problem is that the Indus script has not yet been deciphered. So we do not have written documents through which to follow the king-elephant relation, nor do we have a clear understanding of Indus political organisation.<sup>9</sup> Despite this limitation the existing evidence suggests Indus people were familiar with elephants and that they played a large role in their thought.<sup>10</sup>

Some historians think that the Āryans of the *Rgveda* are the same as the people of the Indus civilisation but the great difficulty for the view is that while the material remains of the Indus civilization show solid-wheeled carts drawn by oxen, they do not show true chariots with spoked wheels, or even true horses, these not being indigenous to India. For this reason majority of scholars believe, rather, that the Āryans came into India from the North West at about 1400 BCE after parting from their linguistic cousins, the Iranians — also chariot warriors. In recent decades archaeologists have begun to find, in the steppes of South Russia, south-east of the Urals, chariot using peoples whose material finds seem to accord in place, time and content with what philologists infer about the ancestral culture of speakers of the Indo-Iranian language from which Sanskrit and the language of Iran descend, the *Sintashta* culture.<sup>11</sup> The horse seems to have assumed great significance as an animal of mobility from the Iron Age (c. 1000 BCE)<sup>12</sup> and the Deccan is rich in Megalithic grave complexes, some situated in the sheep pastoral area. A few of the grave sites have yielded horse bits, horse burials and iron implements<sup>13</sup> suggesting the importance attached to the horse. In short, this evidence shows that the Āryans came into India from a grassy land of horses and chariots to the north. This was a land outside the range of the elephants. India, however, was a land of elephants and forest into which horses had to be imported, and in which a horse-based warrior culture was maintained only at considerable effort and cost as the Āryans marked into the subcontinent further east and south.

The *Rgveda* refers to *mṛga hastin* for the elephant meaning thereby the wild animal having hands with *mṛga*,<sup>14</sup> that is, a trunk suggesting or recalling the inscription of the Egyptian Amenemhab which also called the trunk a hand. This shows that the elephant was a novelty to the Rgvedic people having no words of their own. The *Rgveda* does not provide a solitary reference to an elephant rider or driver (*hastriyāroha*, *hastika*, *hastyājīva*). This suggests that the people of Rgvedic period did not use war elephant or riding elephant.<sup>15</sup> The people of the *Rgveda* and their gods did not use war elephants or even riding elephants. The military consisted of chariots and foot soldiers, and perhaps some mounted warriors but no elephants. The conspicuous example of this can be gleaned from the fact that the god Indra, king of the gods, riding chariots in the earliest text but using the celestial elephant Airāvata in the much later texts. In this context Jane Gonda's logic seems plausible to connect it with the higher dignity accorded to riding horseback in the ancient chariot using civilizations of western Asia

and Southern Europe.<sup>16</sup> It is suggestive that the horse riding was of low status in the warrior culture of Vedic times while chariot riding was of the highest status. Concomitantly, elephants never figure among royal gifts in the *R̥gveda*,<sup>17</sup> but they figure among royal gifts in later Vedic texts. The *dānastutis* specify the things given, which are almost always cattle, and often also gold, slaves, horses and chariots with horses — but never elephants. But elephants soon figure in later Vedic texts as the gifts of kings to poets, or as fees to priests and others officiating at a sacrifice performed by a king. The *Aitareya Brāhmaṇa* mentions rich gift of king Anga to the priest who performed for him the “great anointing of Indra” (*Aindramahābhīṣeka*) : 2,000,000 cows, 88,000 horses, 10,000 slave girls, 10,000 elephants.<sup>18</sup> Anga is located in eastern India where wild elephants abound. Another gift in the same text is that of king Bharata Danṣanti, including 107,000 “beasts black with long tusks”, clearly a poetic reference to elephants, surpassing the gifts of all kings before and after.<sup>19</sup> This indicates that elephants are absent from the early *dānastutis*, whereas they figure as a kind of pinnacle of gift-giving in the later Vedic period. It is significant to note that chariots figure in the royal sacrifices of the Vedic religion, but that elephants enter into such rituals only at the periphery, such as in the form of gifts or sacrificial fees given to officiating priests at the end, and not in the main business of the ritual. Thus in the sacrifice called the *Vājapeya* (drink of strength) there is a chariot race; and a chariot drive of same kind occurs in the *Rājasūya* (royal consecration), the *Aśvamedha* (horse sacrifice) and the *Gavāmayana* (a collective sacrifice making the yearly turning points of the sun’s journey)<sup>20</sup> and thus, elephant comes to be deeply embedded in Indian kingship but this happened in the later Vedic period *c.* 1000-500 BCE, by the end of which this new culture of war had become universal in North India. The objective situation was not conducive in the *R̥gveda* political system. Fighting wars was evidently the most important function of tribal assemblies and the *R̥gvedic* terms such as *gvāma*, *grāmani*, *senā*, *senāri* etc. also underscore this aspect. The nature of the *R̥gvedic* economy was based on principles of gift and redistribution of booty. This prevented accumulation in the hands of the chief who could not grow very strong. The *R̥gvedic* chiefs based their power and wealth primarily on pastoralism.<sup>21</sup>

The idea of using animal power for war in the form of chariot horses had been in practice for a millennium by the time it was extended to elephants. By *c.* 500 BCE the new material and social situation led to the rapid development of such state organs as army and taxation system. The growing prominence given to army is suggested by the exalted place of the *senānāyaka* in the list of high functionaries. At the time of Alexander’s invasion the king of the Gangeridae and Prasii, obviously Nanda ruler of Magadha, kept 20,000 cavalry, 200,000 infantry, 2000 four-horsed chariots and 3,000-6,000 elephants. Chariots were gradually losing their importance not only in the eastern but also in north-western India where they were introduced by the Āryans. The most striking difference in the composition of the army between Magadha and north-western India lay in the use of elephants, of which fewer are mentioned in the later case. As regards cavalry, the king of Arsakenos (part of Swat and Buner) possessed 20,000 cavalry, as many as the Magadhan king did. It is, therefore, evident the possession of elephants gave an edge to the Magadhan monarchy.<sup>22</sup> The significance of the pre-Mauryan period lay in evolving the military, fiscal and judicial organs to meet the new social, economic and political situation in the large territorial state in the middle Ganga valley.

The invention of war elephant was in all likelihood an invention of kingship. Kingship involved both: the developed form of warfare into which elephants could be filled to advantage, and the enormous resources required for the capture, training, maintenance, and development of war- elephants from forest. Now the state is visualised as the intermeshing of seven elements or limbs (*prakṛtis* or *angas*) among which the king is one of the elements. The others are *amātya*, *janapada/rāṣṭra*, *durga*, *kośa*, *daṇḍa* and *mitra*. With the discussion of the *saptāṅga* theory in the *Arthaśāstra*, the concept of state or well defined kingship can be said to have arrived. Our sources convey the impression of centralised bureaucratic control, which is consistent with the vast and expanding economic activities of the Mauryas. This together with a well organised military and revenue machinery helped to strengthen royal power which manifested itself in *śāsana*.<sup>23</sup> The *Arthaśāstra* instructs the king to keep the power of treasury and army in his own hands, implying thereby enormous power to the king who wielded them.<sup>24</sup> The Mauryan kingship also had the elephant-populated forests it needed for the purpose. The *Arthaśāstra* reflects the relationship between kingship, elephant forests, and forest people, leading to the invention of the war elephant.<sup>25</sup>

The *Arthaśāstra* divides elephants according to their work into four categories: elephants under training (*damya*), the war elephant (*sāmānya*), the riding elephant (*aupavāhya*) and the rogue elephant (*vyāla*). Although it does not mention the *ankuśa* in connection with the war elephant, in relation to riding elephants it speaks of one ridden with a stick (*yasti*) and one ridden with a goad (*tottra*), which shows that the *ankuśa* was not used for simple riding.<sup>26</sup> So the hook is a sign of the war elephant and royalty. Elephants served a variety of functions in Indian states but war was their primary function. This adeptness of the elephant's use in warfare was a logical priority as elephants were resources for ancient Indian kings long before the war elephant was invented. But once invented, the war elephant served ever after as the standard for military preparedness.

When the war elephant is put into action in the service of some human purpose it becomes part of the state, an element within larger structures of which the state is composed. The foremost of the structures of use for the war elephant is the army. The army (*bala*) is conceived of as a beast with four (*catur*) legs (*anga*), whence it is a *caturanga-bala*, a fourfold army or an army of four parts or division, of which the war elephant is one, alongside the foot soldier, the horse, and the chariot. The second is *vāhana* meaning a conveyance. Various kinds of *vāhanas* occupy varying positions in a hierarchy of esteem. At the apex is the elephant, the conveyance of the king, the ideal *rāj-vāhana*, and every other conveyance holds its place in the scale in relation to it. The third is the most technical of the three: the battle array or *vyūha*. In this context, elephant holds an important place among other military forces that are drawn up in particular ways from repertoire of arrays – when in camp, on the march, or on the field of battle. *Caturanga*, *vāhana*, and *vyūha* : these three are the salient structures of use, the contexts in which war elephants, once produced, are set in motion. The *Arthaśāstra* presumes a functioning fourfold army and gives a good deal of information about its maintenance and use. The Greek and Latin historians of Alexander of Macedon corroborate this in their record of report that the Nand king of Magadha had a army of 200000 foot, 20000 horse, 2000 chariots, and 4000 elephants.<sup>27</sup> Megasthenes' memoir of his embassy shortly after, to the court

of Mauryan king of Magadha, Chandragupta, gives a description of military organization that includes the four *caturanga* divisions, plus two others connected with army supplies, ox-carts and river boats. This indicates that the fourfold army was a living institution of actual armies.

The *Arthaśāstra* sheds light on *vāhana* and valuation of elephants in the formation of new structure. The *Arthaśāstra* refers the word *vāhana* meaning a means of conveyance. The king assumes many of the attributes, weapons, and *vāhanas* (horse, elephant and chariot), suggesting thereby he is inseparably associated with the horse and with the elephants. Its worship as an embodiment or *vāhana* of the god was also an important part of kingship.<sup>28</sup> The *vāhana* or conveyance which is highly visible and differentiated, manifests a sign of social status, displaying publicly one's place in social hierarchy. Elephants occupy the apex of hierarchy of *vāhanas* and accordingly are ridden by kings, for it is a necessity of kingship that the king be seen as the apex of the social structure. The elephant is explicitly the highest because it is the biggest, hence identified with royalty. The *Arthaśāstra* refers to chariot, elephant or cavalry divisions of the army can, in theory, be the lead element of a unit, combined with other three as support units.<sup>29</sup> This reflects the emerging view that chariots and elephants are equivalent. The soldier's prize for taking either is the same and the king is advised to ride a chariot or elephant, or the force that is predominant in the composition of the army, or that with which he is most skilled. The elephant is a royal conveyance, but the king uses other conveyances. The ancient primacy of the war chariot leaves a strong impress upon the epics, and its prominence has to do with the setting of the story in a deeper past. The war elephant is also present, bearing kings or nameless fighters, but they are not equals of the great chariot warriors. The *Arthaśāstra*, however, indicates how the privilege of the chariots had shifted towards an equality of chariots and elephants. Despite the prestige of the chariots lingered very long, the addition of the elephant to the battlefield and as a royal conveyance, appears to have been sudden, and the universalization of the war elephant in early India proceeds apace. It produced a new way of 'performing' kingship that was very durable. Thus the performance of kingship from elephant-back – the association of the war elephant with kingship – gives the animal a symbolic power that spreads to other spheres of life.<sup>30</sup> But it is significant to mention here that Strabo underlined that no private person is permitted to keep a horse or elephant. The possession of either is a royal privilege, and there are men to take care of them.<sup>31</sup> The strong interest of Indian kingship in elephants and horses gives kings an incentive to put limit upon private capture, trade, and ownership. The ownership of horses and elephants by the Mauryans as the policy of ambitious state, centralizing in this way the means of warfare with spectacular success.

The *Arthaśāstra* reflects the battle formation or *vyūha* of an army in relation to elephants (*hastivyūha*).<sup>32</sup> Armies encamping, marching to battle, and drawn up on the field must be arranged in a certain order at each stage. An arrangement or array is called *vyūha*. Elephants have specific uses in war. The *Arthaśāstra* speaks about the *karmāṇi* or tasks or functions of elephants. The functions of war elephants are many. The most dramatic of them are the breaking down of fortifications and sowing terror in enemy troops on the battlefield. There are in addition more prosaic but highly valuable functions, such as making roadways for the army, assisting in the crossing of rivers, and bearing the treasury. These functions take place in the context of the army as a whole, and the *vyūha* or disposition of troops defines the place of



war elephants in relation to the other. The *Vyūhas* figure prominently in the battlefield scenes in the tenth book of the *Arthaśāstra* on war and kingship. On the march, the sea monster (*makara*) is the order of choice when expecting an attack from the front;<sup>33</sup> the cart (*śakāta*) when expecting an attack from the rear; the thunderbolt (*vajra*) if from the flanks; and ‘good-all-sides’ (*sarvatobhadra*) when from all sides. The sea monster is two triangles joined at the apices, so presenting a wide base to attackers from the front; the cart is a wedge, presenting a broad base to attackers from the rear; the thunderbolt comprises five staggered lines moving forward and therefore, strong against a flank attack; and the name of the good-all-sides array speaks for itself. Having chosen a suitable terrain for fighting,<sup>34</sup> the king should apportion his troops.<sup>35</sup> The parts of the *vyūha* are the wings (*pakṣa*), flanks (*kakṣa*) and centre (literally, the chest, *urasya*), plus the reserve force (*pratigraha*). These parts are composed of units led by chariots, elephants, or horse, each with a complement of protecting forces. Three men fight in front of a horse, plus three footguards; fifteen in front and behind a chariot or an elephant, and also five horses. The king can then make a chariot formation of three-by-three rows of chariots in each of the two wings, two flanks, and the centre, or 45 chariots in all, plus 225 horses and 675 foot soldiers. This is an even formation; an uneven formation would have different numbers in the wings, flanks, and centre. A smaller force should be held in reserve to be inserted as needed. Similarly, a formation can be made of units led by elephants or cavalry. The text then gives consideration to the placement of weaker and stronger troops in the formation. The overall shape of the formation consists of the four primary *vyūhas* such as staff (*daṇḍa*), snake (*bhoga*), circle (*maṇḍala*) and non-compact (*asaṃhata*).<sup>36</sup> In the final section of its tenth book the *Arthaśāstra* explains the choosing of a *prati-vyūha* : attack a cleaver with a buttresser; a buttresser with an irresistible; a falcon with a bow; a fixed with a firmly fixed; victor with a conqueror; a pillar-eared with a wide conqueror; a flying-about with a good-all-sides; and all *vyūhas* with the invincible. Of foot, horse, cavalry, and elephant forces; he should use each latter one to attack a former one; and a deficient unit with a super-abundant one.<sup>37</sup> From the four types, the many sub-types and the counter-types, it is evident that the doctrine of the *vyūhas* in the *Arthaśāstra* had reached a certain fullness and is by no means in the first stage of development.

The *Arthaśāstra* provides the ethnography of war elephant management and deployment of elephant for battle. To maintain war elephants, their trainers had to acquire very specialized practical knowledge of many different aspects of elephants and their management. In order to understand the place of war elephants, the *Arthaśāstra* accords to the war elephant important place in the over-all structure of kingship. The *Arthaśāstra* describes in its very first book, the person of the king, his security in his own palace and family, his training, daily routine, and demeanor. Thereafter roughly half the remaining text addresses the internal administration of the state in all its working parts, producing wealth, and maintaining good order. The portion of the *Arthaśāstra* dealing with internal administration opens in Book II in terms of the economic zones into which the territory is divided. This gives us what we might call ecology of the state or economics of kingship. First came a pair of chapters dealing,<sup>38</sup> respectively, with the settlement of the countryside into forming villages, and with the disposal of non-farming land into pastures and forests of several kinds such as forests for wild animals (*mṛga-vana*), forests for raw materials (*dravya-vana*) and elephant forests (*gaja-vana*).<sup>39</sup> The text refers how the

elephant forest is to be established on the border of the state guarded by forest people (*qṭavī*). The overseer of the elephant forest and the elephant forest guards are to protect it. They are to kill anyone slaying an elephant; but someone bringing the ivory of an elephant that has perished naturally should be given a reward in coined money.<sup>40</sup> It is clear that the demand for ivory is to be satisfied from elephants already dead, not from killing them and that killing them for any reason elicits the ultimate punishment. The overseer of the elephant forest has a staff, of which the text mentions guards of elephant forest, elephant keepers, foot chainers, border guards, forest rangers, and attendants. Those disguising their scent with the urine and dung of elephants and concealing themselves with the branches of trees, should move with five or seven female elephant decoys to “find out the size of the elephant herds, by means of signs provided by sleeping places, footprints, dung and damage caused to riverbanks,” and “keep a written record of elephants – those moving in herds, those moving alone, those driven from a herd, and the leaders of herds, as well as those that are dangerous, in musth, the youngster, and those released from captivity.” They should capture elephants deemed excellent in the judgement of elephant trainers.<sup>41</sup> This vivid picture has several features deserving mention: active protection of elephants and harsh punishment of poachers, the keeping of an ongoing census of elephants in the forest of different classifications and the use of forest people for the work. The text suggests that the elephant trainer and physician are settled there by grant of the king.<sup>42</sup> They are not forest people, and live in villages, but they supervise and direct forest people who live where they work.

Elephants are to be captured during the hot season, which is when they are more concentrated near the remaining sources of water and can be more easily seen because the deciduous trees have dropped most of their leaves. Twenty years is the ideal age for capture, and young animals, tuskless males (*makhnas*), diseased elephants, and females with young or sucking a baby are not to be captured.<sup>43</sup> This is a very important statement for it tells that capture is aimed at those most difficult to capture : large adults. The demographic profile of the king's elephants implied by this passage is very different from that of all other kinds of elephant in use, such as in timber operations, zoos, and circuses, in all of which the bias is toward females and the practice is to capture younger animals. The *Arthaśāstra* speaks of eight regional elephant forest as a basis for a division into three classes of quality. In quality and probably in quantity too, elephants are unevenly distributed across India because of the uneven distribution of their habitat, and kings disadvantaged by this factor are recommended to resort to other means, for acquiring them. It is in this connection that the *Arthaśāstra* underlines the comparative advantages of the Himalayan trade route and southern route. The first supplies horses and elephants among other things; the second is better, supplying elephants and a greater abundance of precious goods.<sup>44</sup> We must not suppose this was a free, price-making market. Kings were the main purchasers of horses and elephants; private ownership of either was restricted and in the case of the Mauryas there was a royal monopoly, which was simply the limiting condition of a constant tendency of Indian kingship to treat horses and elephants as crucial military assets.

Elephants were also acquired in various kinds of king-to-king transactions. The *Arthaśāstra* does not give us a summary statement of the modes of acquisition. But it does give such

a summary statement in respect of horses, so it will be useful at this point concerning the complementary distribution of horses and elephant in India, and the king's problems with securing their supply. The overseer of horses, the *Arthaśāstra* tells us, should make a written record of the total number of horses, and the ways in which they have been acquired, of which the passage distinguishes seven: gift, purchase, taken in war, born in the bed, received in return for help (from an ally), pledged in a treaty, and borrowed for a limited time (again, from an ally). He is to record their pedigree, age, colour, marks, class, and source, and report those defective, crippled, or sick.<sup>45</sup> Thus horses circulated among kings in many ways that would also have pertained to elephants. Trade is only one of the modes of acquisition, but a crucial one as the best horses came from beyond India. According to the *Arthaśāstra*, "the best come from Kāmboja (the northwest), Sindhu (Sind, the lower Indus valley), Āraṭṭa (in Punjab) and Vanāyu (Iran), the middling from Bāhlika (Balkh or Bactria) in northern Afghanistan), Pāpeya, Souvira and Titala; the rest are inferior."<sup>46</sup> No doubt one of the enduring features of the history of kingship in India is that the horses are both scarce and essential.<sup>47</sup> The western and northern regions were privileged over the eastern and southern ones in respect of horses, and this greatly affected inter-state relations. But the king in the *Arthaśāstra* could also acquire horses through gift, war, an ally for help rendered, by treaty, and by borrowing (from an ally). Thus horses are assets of great interest to kings, and their circulation is governed largely by king-to-king interaction. They may also be bred in the stables, but superiority of horses from the west and the north was never overtaken by country-bred horses.

The case of elephants is entirely different. Elephants being indigenous, the king were advised to establish elephant forest (*gaja-van*), distinct from the material forest (*dravya-vana*) and acquire them in wild. Apparently the abundance of elephants in the wild was such that any given state may have them in its territory. Elephants were captured wild, tamed and trained for work and war, but they were not domesticated from birth. The main reason for this mode of acquisition is purely economic. Elephants are prodigious eaters and do not reach the age at which they can be used for human purposes until twenty years, so it is far cheaper to capture them as adults rather than rear them from birth and feed them in stables. Elephants too come in different grades of quality as do all the items in the inventory of the state. Like horses, different breeds are identified with different regions of origin in the *Arthaśāstra*: "Elephants from the Kaliṅgas and the Angara are best. Those from the east, Cedi and Karūṣa, from the Daśārṇas and Aparāntas are considered middling. Those from Surāṣṭra and Pañcanada are said to be worst. The courage, speed, and energy of all are increased with training."<sup>48</sup> The quality of elephants declines from east to west, best coming from Orissa (Kaliṅga), the poorest from Punjab (Pañcanada) — where they are longer found. The geographical horizon of this passage is of the northern parts of India, but another passage suggests that elephants were acquired by trade both from the Himalayas in the north and from the south.<sup>49</sup> The primacy of elephants in warfare is underlined: "A king's victory is led by elephants, for elephants, with their enormous bodies and lethal onslaught, can crush an enemy's troops, battle arrays, forts, and military camp."<sup>50</sup> Thus, the *Arthaśāstra* mentions victory (in battle) for a king depends principally on elephants. For, elephants, being possessed of very big-sized bodies and being capable of life-destroying activities, pound the troops, battle-arrays, fortresses and camp of enemies. In fact, kings are drawn to elephants because of their size, which is useful to kings as a signifier of the



superlative character of kingship.

More manageable, though no less costly, was the problem of acquiring elephants. But on the whole, India was self-sufficient in elephants and it was net exporter of those animals to other countries. Under the Mauryas, elephants were dispatched to the Greek kings of Syria, the Seleucids.<sup>51</sup> Seleucus concluded a treaty with Chandragupta by which he ceded the greater part of what is known as Afghanistan and the Indus valley to the latter and received 500 elephants in return. This shows the high value that was placed on elephants and their importance in diplomacy. From then on, the Mauryans were a source of elephants for the Seleucids. It is notable that this was a king-to-king transaction, not a market exchange. The Greek kings of Syria (the Seleucids) and Egypt (the Ptolemies), who were rivals, sent emissaries to the Mauryas, no doubt seeking elephants for the wars between them. The account that survives of Megasthenes' embassy under Seleucus shows a great interest in Indian techniques of capture and training elephants. This elephant-trade at the level of king-to-king relations also included the men who possessed skills to be elephant drivers because the Greek word for an Indian (*Indios*) acquired the specialized meaning of elephant-driver. Subsequently, the Ptolemies and the Carthaginians used Indian techniques to capture and train African elephants, and the Carthaginians under Hannibal took a body of elephants (38 in number) across the Alps to attack Rome during the Second Punic War. The failure of that venture largely brought an end to elephant warfare in the west. The Romans used military elephants, but were too far removed from the source of Asian elephants to continue for long. During the fourth and the third centuries BCE there had been to the west of India a kind of arms race brought about by the Greeks involving Indian war-elephants. The use of war elephants was also adopted by the Indianized states of South-east Asia, as a part of the Indian model of kingship.

Like Kaṭṭilya, Megasthenes' *Indica*<sup>52</sup> provides a fair description about elephants. Megasthenes mentions warriors as the second largest caste, second only to farmers, and gives the size of Chandragupta's camp as 400,000 warriors. Taken together, we infer a large treasury and a vigorous system of taxation. It is entirely possible that elements of the Mauryan system were started by the Nandas but the latter enlarged the scope of taxation and their wealth to fantastic proportions. Megasthenes' testimony indicates that the Mauryan army was on paid system rather than a landed warrior class. The centralization and enlargement of army power were a larger part of Chandragupta's advantage in the expansion of his empire. Megasthenes depicts the administration as having three main parts: country, city and military administration, each directed by a board of five, and each with six functional divisions. The country / city distinction of civil administration corresponds well with what is found in Indian texts, administering the country having to do mainly with taxing peasant and herders and other rural producers, the city having to do with the regulation and taxation of markets, among other tasks. The military administration is divided among the parts of the fourfold army plus divisions devoted to boats and oxen for the supply of the army. It is in this context that all important royal monopoly of arms, horses and elephants is expounded. This rounds out the picture of the remarkable Mauryan military system : disarmed peasant class whose function is to generate the bulk of taxation which pays for the army. This system must have been the main driving force for Mauryan expansion, and its unprecedented success would, in turn, have

provoked emulation by kings who saw it. And that would in turn have worked as a powerful engine for the spread of the war elephant and the fourfold army. The unprecedented features of the Mauryan military force that make its success in encompassing most of India intelligible was the appropriate utilization of war elephant.

Megasthenes gives a detailed method of capturing adult elephants. Basically, the method is to use docile female elephants as bait, which shows that the aim was to capture large male tuskeders suitable for battle, and not only to obtain elephants for work and to ride on. The method is to dig a large circular moat with a single wooden bridge, putting the female elephants within the moat. The wild elephants are not driven in during daytime; they find their own way at night, drawn by the smell of the females. They go round the moat till they find the bridge and cross into the enclosure. Elephants that are too young or too old or diseased are released. The emphasis upon the capture of adult males is consistent with what the *Arthaśāstra* prescribes and implies the same demographic profile of the royal herd of captive elephants – the dominance of adult males. Megasthenes describes the taming of newly captured elephants in some detail. They are allowed to become hungry and thirsty; their feet are hobbled by brave skilled hunters; they are beaten by tame elephants till they fall over; a leather rope is put around the neck, and the skin of the neck cut with a knife so that they feel the noose when it is pulled. That is the stick; the carrot follows, consisting of singing with cymbals and drums to lull them to sleep, among other things.<sup>53</sup> In this way the unprecedented success of the Mauryan expansion would have been a powerful advertisement to other kings for adopting the war elephants and the fourfold army.

The *Arthaśāstra* reflects the relationship between elephants and state by shedding light on *hathisār* as a state-sponsored institution employing subaltern experts. The *Arthaśāstra* gives directions for making of stables, their staffing and provisioning of fodders. A chapter is devoted to the overseer of elephants, who is in charge of the guiding of elephants, forest and looking after stables, fodder for elephants of different classes, their work, harnesses, and other accoutrements, and the staff<sup>54</sup>: “He should have a stable constructed, a stable whose height, width and length are twice the length of an elephant; that has additional stalls for female elephants, an entrance hall, and ‘princes’ configuration and that faces the east or the north. He should have each stall constructed square in shape with each side that of the length of an elephant, a stall that is equipped with a smooth tying post and a floor made of smooth planks, and that has an outlet for urine and excrement. He should have a place for lying down that is the same in size as a stall but half as high prepared, within the fort for military and transport elephants, and outside the fort for elephants under training and for various elephants. Within the eight-fold division of a day, the first and the seventh are the times for bathing, and immediately thereafter for feeding. The time for exercise is the forenoon, and the time for the stimulating drink is afternoon. Two parts of the night are for sleeping, while a third part is for lying down and getting up.” The overseer of elephants appears to supervise capture operations, the criteria of which have already been described, although the overseer of the elephant forest also seems to have a role. Stabled animals need to have food brought to them because they are working animals; the energy expended has to be made up by fodder raised by peasants. The most natural part of the ration, which for elephant is grass and browse, is brought by grass cutters

and leaf cutters attached to the stable. In the routines of the granary, it is said out that the best of the milled śāli rice is to go to humans, the inferior part to animals. The amount of detail the *Arthaśāstra* provides is surprising.<sup>55</sup> The underlying principle is that the smaller the amount of rice obtained from milling a unit of paddy the higher the quality, as it is more thoroughly cleaned of the bran. Thus the lowest quality is 12 āḍhakas rice milled from 5 *droṇas* of śāli paddy, which is only suitable for a young elephant (*kalabha*), with higher qualities giving us a hierarchy of beings such as 12 for a young elephant, 11 for vicious elephants (*vyūha*), 10 for riding elephants, 9 for war elephants, 7 for chiefs, 6 for queens and princes and 5 for the king. Broken grains and bran are for the lowest-ranked humans and lesser humans. The *Arthaśāstra* tells that the overseer of granary and those who draw on it have to know the rations for animals of different kinds.<sup>56</sup> In case of elephant, the model food ration is given per cubit (*aratmi*) of animal's height, so that the calculation is one of simple multiplication and ration has three structural parts : cultivated and processed food; the "invigorating drink" or *pratipānam* as a restorative; and the basic natural food of grass or browse.<sup>57</sup> To begin with, there is a core ration consisting of grains or beans, oil or fat, salt, meat, and yoghurt or juice for moistening the lumps. The most important of these and the largest in quality is the grain ration, which is the most variable: for bullocks, oil-cakes or broken grains and bran; for horses, rice or *priyangu*, or beans (*mudga* or *māṣa*), half cooked; for elephants rice grains. Next the text also makes provision for an "invigorating drink (*pratipānam*) which, for bullocks, consists of milk or liquor (*surā*) plus fat, sugar, and ginger; for horses and elephants, liquor and sugar, processed foods providing high energy". Then it gives an allowance of oil for nose of the bullock, fat for the nose of the horse, or oil for limbs and head of the elephant. All of this would have been supplied from granary. Finally, the animals are given large quantities of more natural food : green fodder (*yavasa*) for bullocks and horses, grass and "leaves of plants" or browse (without limit) for elephants, likely supplied by grass-and-leaf cutters attached to the stables.<sup>58</sup> It is significant to note here that the *Arthaśāstra* prescribes meat (*mamṣa*) for all three of these herbivorous animals. It might be possible that meat in the *Arthaśāstra*'s ration for bullocks, horses, and elephants was intended for their restorative, strengthening power.<sup>59</sup>

The *Arthaśāstra* provides a fairly detailed description of staff under the overseer (*nāgavanadhyakṣa*) such as forest people (*ātavi*), guard (*nāgavanapāla*), elephant keeper (*hastipaka*), foot chainer (*pādapāśika*), border guard (*saimika*), forest ranger (*vanacaraka*) and attendant (*pārikarmika*).<sup>60</sup> In connection with the stables and the overseer of elephant (*hastvadhyakṣa*), the *Arthaśāstra* underlines some occupational specialists like physician (*cikitsaka*), trainer (*anīkastha*), rider (*ārohaka*), driver (*adhoraṇa*), guard (*hastipa*), decorator (*upacārika*), cook (*vidhāpācaka*), fodder giver (*yāvasika*), foot chainer (*pādapāśika*), stall guard (*kuṭīrakṣa*) and night attendant (*upaśāyika*).<sup>61</sup> This is a fairly complex division of labour, implying a large commitment of the state's resource to maintain them and an internal hierarchy to co-ordinate efforts. The relation between the elephants and human trainers manifest the overall structure of the state, as reflected in the pattern of salaries delineated in the *Arthaśāstra*.<sup>62</sup> This gives us a hierarchy in which elephant staff of various kinds are positioned. The text mentions 8,000 *paṇas* for heads of banded troops, commandants of elephant, horse, and chariots corps, and magistrates; 4,000 *paṇas* for overseers of infantry, cavalry, chariots and elephant corps, and wardens of materials and elephant forests; 2,000 *paṇas* for charioteers, elephants trainers,

physicians, horse trainers, and carpenters, and the breeders of animals; 1,000 *paṇas* for diviners, soothsayers, astrologers, chroniclers, bards and panegyrists; assistants to the chaplain and all overseers; 500 *paṇas* for foot soldiers trained in the fighting arts and accountants, scribes and the like; 250 *paṇas* for musicians and the makers of musical instruments; 120 *paṇas* for artisans and craftsmen and 60 *paṇas* for servants, helpers, attendants etc. This pay scheme suggests that military personnel are highly ranked, and so is the upper level of the elephant staff. The highest paid in this list are commandants in battle of the four limbs of the fourfold army; next to them, at half pay, are overseers of four limbs, along with the warden of the elephant forests. The next lower step is occupied by the elephant trainer, physician, and horse trainer, the three ranks for whom the king is to give land in the village<sup>63</sup> – an important sign of distinction. It is noticeable that the elephant trainer ranks much higher than the mahouts and other staff who are at the lowest pay level, several steps below. The expertise of the trainer seems to be considered superior, and the *Arthaśāstra* singles him out as the one whose knowledge of the qualities of individual elephant is to govern the process of capture. On the whole the upper grades of the elephant staff are very well compensated.

The theoretical construct of kingship delineated in the *Arthaśāstra* was followed by successor texts such as the *Nitiśāstra* of Kāmandaka,<sup>64</sup> *Yaśastiloka* of Somadeva Suri, the *Mānasollāsa* of king Someśvara III Cālukya and *Harīharacaturanga* of Godāvaramiśra, minister to Pratāparudradeva of the Gajapati kings of Orissa.<sup>65</sup> Franklin Edgerton's analysis and translation of *Mātangaḷīlā* shows that elephant lore has a long antiquity as depicted in the *Arthaśāstra*. In his view the specialized treatises on elephant lore come after the *Arthaśāstra*, being new formations in the developing literature of the conduct of the state.<sup>66</sup> This appears very plausible. However, the *Arthaśāstra* does not speak of an elephant science nor does it attribute elephant lore to holy personages of the deep past, yet there are some published specialized Sanskrit treatises on elephant lore such as the *Gajaśāstra* (*Elephant science*) of Pāṅkāpya, the *Gajaśikṣā* (*Elephant training*) of Nārada, the *Mātangaḷīlā* (*the Play of Elephants*) of Nīlakaṇṭha and the *Hastyāyurveda* (*Elephant Life Science*) of Pāṅkāpya.<sup>67</sup> This is suggestive of appropriation of practical knowledge of elephants by the literati from the staff of the king's elephants establishment and turning into the kind of knowledge over which the literati have authority. The specialized treatises show a tendency towards the reinterpretation and theoretical elaboration of practical knowledge. Thus the *Arthashastra* sets a trend.

## CONCLUSION

The preceding discussion makes clear that taxation system and standing army are two important sources of kingship. This interconnection is stressed by Kauṭilya. The *Arthaśāstra* enumerates seven elements (*saptāṅga*) suggesting thereby *daṇḍa* as an important element. This element consists of soldiers comprising infantry, chariots, elephants and cavalry. Clearly establishes that elephant got deeply embedded in Indian kingship. The long history of war elephants can be delineated. The Indus civilisation is the likely precursor of the invention of the war elephant in the later Vedic period but the problem is that the Indus script has not yet been deciphered, therefore we do not have information on either the king-elephant relation or a clear understanding of Indus political organisation. Despite this fact, the existing evidence suggests that Indus people were familiar with elephants. It is significant to note that the

Ṛgvedic people were not familiar with elephants. The *Ṛgveda* refers to *mṛgahastin* indicating thereby the elephant was novelty to the Ṛgvedic people having no words of their own. The nature of lineage society was not conducive for a new political formation. Elephant comes to be deeply embedded in Indian kingship in the later Vedic period c. 1000-500 BCE by the end of which the new culture of war had become universal in North India. By c. 500 BCE the new material and social situation led to the rapid development of such state organs as army and taxation system. No doubt possession of elephant gave an edge to the Magadhan monarchy. The invention of war elephant was in all likelihood an invention of kingship. With the success of *saptāṅga* theory in the *Arthaśāstra*, the concept of state or well defined kingship emerged. The *Arthasastra* reflects the relationship between kingship, elephant, forests, and forest people leading to the invention of war elephant. The ownership of horses and the elephants by the Mauryans as the policy of state centralised in this way the means of warfare with spectacular success. The *Arthaśāstra* provides the ethnography of war-elephant management and deployment for battle in the over-all structure of kingship. The *Arthaśāstra* underlines that victory (in battle) for a king depends primarily on elephants. For, elephants, being possessed of very big-sized bodies and being capable of life-destroying activities, pound the troops, battle-arrays, fortresses and camp of enemies. In fact, kings are drawn to elephants because of their size, which is useful to kings as a signifier of the superlative character of kingship.

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# RECENT ARCHAEOLOGICAL FINDS AT KRIMILA: THEIR IMPLICATIONS ON THE HISTORIOGRAPHY OF EARLY MEDIEVAL INDIAN HISTORY

Anil Kumar\*

## ABSTRACT

*Krimila Adhithana, an early medieval religious-cum-administrative centre of eastern India is located in the area around Lakhisarai, a modern town and districts headquarter of Bihar. Valgudar (a village 3km north from the modern district headquarter of Lakhisarai) was the centre of Krimila Vishya. Mention of Krimila Vishya also occurs in various Gupta and post- Gupta inscriptions. Krimila was a prosperous medieval city lying between two major monastic universities- Nalanda and Vikramashila. The present paper reports two important recent finds from this area. In a recent course of exploration in area east of river Kiul (Krimikal), a hill which is located between the two modern villages, Bicchwe (Long. 25.165837) and Shringarpur has been identified for archaeological excavation. Height of the hill from the surface is approximately 125 meters, over which twenty seven cells made of post -Gupta bricks were discovered. These cells are of various size, 14/9', 12/8', 11/9', 8/6' and 6/4'. Along with these cells, 90 meter long and 30" thick brick wall running east to west is visible. Scientific clearance and proper excavations of this place by competent archaeologists may yield existence of several similar chambers (Cells), which appears as remain of a big Buddhist Vihara.*

**Keywords:** Buddhist iconography, Falgu, Ganga, Kimilasutta, Krimila, Nalanda, Pala.

## INTRODUCTION

The post-Gupta social formation was marked by the emergence of regional identities. Right from the time of the Guptas, and more so during the post- Gupta time the process of the origin and evolution of states which was till then confined to the upper and middle valleys of Ganga with some activities on this front also going on in some other parts of the sub-continent,

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came to acquire a regional dimension. This was preceded by a large-scale agrarianisation of the erstwhile peripheral areas and this in turn set in motion the beginnings of differing patterns of regional economies during the period. In the case of eastern India, despite sub-regional variations, one encounters the emergence of a cultural idiom that can be said to have assumed an identity of its own.

While talking about eastern India, one needs to take into consideration the differing conjunction of forces that operated in its three sub-regions – Mithila, Bengal and Orissa. While a large part of Bihar constituting the mid-Ganga valley had hitherto been the core area of economic development, the area of Bengal was yet to undergo that process of the exploitation of natural resources. Despite the Magadhan intrusions into these areas and the emergence of localized state systems, the developed elements of material culture had at best made only a nominal presence with their major segments remaining in the backwaters of economic development. Data pertaining to the urban centres in eastern India makes it imperative that the dominant theory of decline of urban centres from the Gupta period needs to be evaluated afresh. This explanatory model is developed primarily on the basis of empirical data germane to the upper and the middle valleys of Ganga. (i) Can one accord a Pan-Indian validity to the explanatory models developed primarily on the basis of empirical data germane to the upper and middle valleys of Ganga?; and (ii) Can one deny the specificities endemic to the formations that start crystallizing from the Gupta period? The two queries become extremely pertinent in the context of the developments of Gupta and post- Gupta times, the developments that undermined the hitherto dominant status of the mid -Ganga valley and led to the emergence of cultural nuclei in the erstwhile peripheral regions. Even a casual survey of the available archaeological data from Bengal would vindicate this pattern of social formation. Survey of sources reveals the change in the functional nature of urban centres during the period. Majority of urban centres in early eastern India during ancient period were either commercial or administrative, but the situation started changing during Gupta period. There are references indicating that such centres continued to exist during Gupta and post -Gupta period with changed character. Most of the urban centres were converted into either religious or fortified administrative nuclei during this period. This change in character itself is indicative of their disassociation from the mercantile activities. There is hardly any convincing evidence of large scale external trade in the early medieval eastern India. The decline in trade is attested by the decline in the fortunes of sea ports of eastern India by the Gupta times. Seemingly, the expanding agrarian economy along with the on-going process of state formation in the area sustained the urban centres that also emerged as centres of community activities in differentiation.

Responses to these queries shall, no doubt, assume centrality in any discourse related to the making of early medieval India. Such an exercise needs to explicate the concern that all region-specific developments, if these have to have any bearing on the attempts to construct our past, have to be related to the broader processes of the concurrently dominant social formation. A negation of this reality would tantamount to the denial of the elements of commonality in regional formation in north India. Such a stance leads to the projection of a pattern of cultural evolution characterized by the insolubly situated and spatially fragmented societies. Adherence to such a formation brings one face to face with a number of questions

that are conceptually uncomfortable. If the process of evolution of regional cultures is exclusively rooted in the complexities of their respective spatial context, then why is it that such a process, almost in every region, starts during the same period, i.e. the 5th-6th centuries A.D.? Has it anything to do with the social restructurings that the upper and middle valleys of Ganga underwent during this period? Moreover, how to rationalize for those elements of regional cultures, too intelligibly articulated to be ignored, that were obviously disseminated from the mid-Ganga valley? The construction of an “alternate mode” of analysis, therefore cannot afford to disengage itself from the dominant historical process of the times. It is with these concerns at the centre stage that the present paper seeks to explore the twin issues of the differential pattern of urban growth in north India during the Gupta period and the factors responsible for the emergence of cultural nuclei (the contemporary urban pattern being one of its manifestations) in the erstwhile peripheral regions.

An archaeological survey of northern India of the times brings to the fore a significant chronological dimension of the habitational pattern of the early Indian urban centres. Despite suggestion to the contrary, these settlements do not admit of a history of habitation that may be fitted into any universally applicable and chronologically standardized format. The dominant stand in the current debate on the question of urban decay in early India, however, ignores this variant chronological schema of decline obviously to buttress the hypothesis of the emergence of the homogeneous and chronologically uniform feudal formation from the Gupta/post-Gupta period. This dichotomy between urban tradition and feudal formation has been accorded such an absolute relevance in Indian historiography that complete negation of urban form becomes a logical deduction in the context of the feudal mode of production. Is the antagonism between feudalism and towns so intense? Does one negate the other so comprehensively? Or does it distinctly underline a pattern of urban decline that was both qualitative and quantitative in nature? What is then the specific form of opposition between the two?

Marx, in his apparently Eurocentric definition of the specificity of the feudal town, does lay bare the dynamics of the relationship: “The history of the classical antiquity is the history of the cities, but of cities founded on landed property and agriculture: Asiatic history is a kind of undifferentiated unity of town and countryside (the largest cities must be regarded here as royal camps as works of artifice created above the economic construction proper); the Middle Ages (Germanic period) begins with the land as the seat of history, whose further development then moves forward in the opposition between town and countryside; the modern age is the urbanization of the country, not realization of the city as in antiquity.” This opposition need not be construed as a complete negation of towns in the feudal complex. The complex of an inherent antagonism between feudalism and towns as well as the latter’s separation from the countryside finds an echo in the writings of Max Weber, Ferdinand Braudel and Sjoberg who delimit the town as an institutional expression of power. Taking the cue from Weber, Philip Abrams situates the town in a larger social context called the complex of domination, which is marked by a struggle to constitute and elaborate power. Such a concept of domination and power associated with the medieval European towns had a crucial bearing on the explanations related to the formation of the cultural and economic base for the origins of capitalism. The projection of these “*non-feudal*

*islands in the feudal seas*” as the prime mover towards capitalism underlines this position. The more recent writings, however, do not talk in terms of an absolute antagonism between feudalism and towns, rather they underscore the changing functional nature of these settlements. Now the process of urbanization is sought to be situated within the feudal system and the medieval towns are seen as development integral to it. Significantly it has been suggested that the feudal pattern of social control constrained economy within towns and instead of looking for urban origins of capitalism one should look for its rural roots. A feudal society, therefore, does not negate the very tradition of urbanization; it only makes the town bereft of meaningful economic initiatives. The suggestion that some of the early towns declined and got transformed into centres of pilgrimage underscores a similar functional mutation. Krimila, an early medieval religio-administrative centre of eastern India can be used an example for early medieval urban centre.<sup>1</sup>

Krimila Adhithana is located in the area around Lakhisarai, a modern town and districts headquarter of Bihar. Valgudar (a village three km north from the modern district headquarter of Lakhisarai) was the centre of Krimila *Vishya*. Mention of Krimila Vishya occurs in the Gupta and post- Gupta inscriptions also. In this regard, Nalanda plate of Samudragupta, Bihar inscription of Gupta period, Naulagarh inscription of Pala period and two other inscriptions discovered from Valgudar and its adjacent area are significant. In one inscription it is mentioned that in the Dharmapala's kingdom at Krimila *Vishya Madhu Srenika* (A guild of honey collectors), in honor of Dharmapala, has founded a *Devadhammayam* i.e religious centre. In this inscription, Krimila is mentioned as *Adhithana*, and this word has been taken to mean as centre for administration i.e. a city or town. Another inscription from Valgudar gives us very important information about the date of the Pala ruler Madanapala, in which we learn that during the 18th regnal year of his rule a Narayana image was installed by two Paramavaishnava Bhatta brothers, Shree Sukim Bhatta and his brother Shree Abhi Bhatta with his father, in the Saka era 1083. Hence, from this inscription we can conclude that Madanapala had ascended the Pala throne in 1143 A.D. and ruled at least for 18 years that would mark the year 1161 A.D. In this inscription, the place Krimila is prominently mentioned. Munger copper plate inscription of Devepala mentions Krimila Vishya in Srinagar Bhukti (Pataliputra has been identified as centre of Srinagar Bhukti). Mention of Krimila as a nagara is also found from the contemporary Brahmanical and Buddhist texts. There is a tradition recorded in *Harivamsa* and *Vayu purana* that a local ruler Krimi, son of Usinara, a king of Puru dynasty, was the lord of Krimilapuri, early Buddhist works mentions Krimila as a very old city, situated on the bank of river Ganga, which witnessed activities of the Buddha. Two suttas, entitled *Kimilasutta* and *Kimilasutta*, were preached by Buddha when he was camping at the *Venuvana* at the city of Krimila. Analysis of these inscriptions and literature suggests that this place flourished in ancient period and continued as an important religio- administrative centre up to 12th century A.D. Another significant aspect is donation by the merchant community and existence of guild during the period of Dharmapala, the ruler of Pala dynasty in 9th century A.D.<sup>2</sup>

Antiquarian remains around this region take us towards early historicity of this region which is much earlier than the Gupta period. Cunningham identified *Lo-in-ni-lo* mentioned by Xuanzang at Rajaouna. Xuanzang mentions that he visited this place, where he saw a

The map shows the Lakshadweep archipelago in the Arabian Sea. The islands are color-coded and labeled as follows:

- Kavaratti** (Kavaratti): The capital island, colored purple.
- Andaman** (Andaman): A small island to the north of Kavaratti, colored yellow.
- Lakshadweep** (Lakshadweep): The central island, colored red.
- Minicoy** (Minicoy): A small island to the south of Lakshadweep, colored yellow.
- Three smaller islands** (Three smaller islands): Three small islands to the east of Lakshadweep, colored green, blue, and yellow.

### Map 1: District Map of Lakhisarai



The geographical location of this region is significant; the place is situated on the confluence of three major rivers of eastern India: Ganga, Haruhar and Kiul. The existing morphology of river Ganga is around five km north. However, earlier scars of river are still visible at the site. Moreover from the scar, white sand of Ganga is available. The geographical as well as historical significance of the river Ganga is well known. No less important in this respect is the river Haruhar, as it connects the entire south Bihar. The river Haruhar originates near Nalanda as one of the branches of the river Falgu. Besides Ganga, both the rivers Haruhar and Kiul are perennial in nature and connected to the early historical places of Bihar. As far as the river Haruhar is concerned, it connects Lakhisarai with early historical centers like Nalanda, Rajgir, Bodh-Gaya in south and while merging into Ganga at the site, it connects Pataliputra and Varanasi in the west, Munger, Champa and Tamralipti in the east. River Kiul does have significance in these connecting possibilities. R. Kiul is connected with southeast region of Bihar. Early reference to this river is mentioned in several Buddhist texts like *Anuguttarnikaya* and *Moghhevagga* in which this river is called Krimikala and on the bank of this river *Chaliya Parvat* was situated, where Buddha spent time during rainy season. Buddha spent his 13<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> rainy seasons at this mountain. It is significant to note that the river Kiul passes through these two mountains, one on the western bank another is on the eastern bank and on top of these two mountains, there are antiquities of ancient period lying unprotected.

Historical geography of this place is of great historical significance because on the northern bank of this confluence early historical site of north Bihar, Naulagarh is located. This place might have been used as a river port, because almost all the important rivers of north Bihar again connect Naulagarh, situated just opposite Lakhisarai, on the northern bank of this confluence. Particularly during the Pala rule in north Bihar (north of river Ganga), we get plenty of black stone sculptures in various sites i.e. Dumra, Akaur, Ucchaith, Mahisi, Kapilesvara, Balirajgarh, Kopagarh, Andhra Tharhi etc.<sup>3</sup> Non-availability of material in north Bihar for making sculptures in this period is key factor before us. Topography of north Bihar reveals the existence of only plain land, and black stone used for the making of sculptures were perhaps procured from South Bihar region. To carry stone slab for construction or carving of sculpture, it is certain that the river routes would have been used. Significance of the location of these two places Valgudar and Naulagarh, one on the southern side and another on the northern side has to be taken into account. Moreover, their connectivity with major rivers of south and north Bihar leads towards this conclusion. Further Lakhisarai is also situated between Nalanda and Vikramshila, the two religio-educational centers of early medieval Bihar. Another significant aspect is that the location of this place can be pinned on the old Pataliputra to Tamralipti route (via Champa). The ancient connectivity of this place has been discussed by Claudine Bautze-Picron in her study of late Buddhist Iconography of sculptures found in Lakhisarai (1991-92).<sup>4</sup>

The purpose of the present paper is to report two important recent finds from this area. In a recent course of exploration in area east of river Kiul (*Krimikala*), a hill which is located between the two modern villages, Bicchwe (Long. 25.165837) and Shringarpur. Height of the hill from the surface is approximately 125 meters, over which twenty seven cells made of post-Gupta bricks were discovered. These cells are of various size, 14/9', 12/8', 11/9', 8/6' and 6/4'. Along with these cells, 90 meter long and 30" thick brick wall running east to west is visible.

Scientific clearance and proper excavations of this place by competent archaeologists may yield existence of several similar chambers (cells), which appears as remain of a big Buddhist Vihara. In the centre of the hillock, a 40’/27’ courtyard has been identified. Photographs of these structures are given below.



**Picture: 1**



**Picture: 2**



**Picture: 3**



**Picture: 4**



**Picture: 5**



**Picture: 6**

(*Source:* Kumar, Anil, 2016)

Besides these remains on the top of the hill; at the middle of the same hill there is a cave of 17/4 meter in size, facing towards south west direction. It is worth mentioning that from this hill towards south west, another hill exists around three kilometers on the bank of river Krimikala (modern Kiul). This hill is located in the modern village of Ghosi Kundi, where remains of a Buddhist Stupa are reported first by Alexander Cunningham. He had done preliminary excavation of this Stupa and found the relic casket, containing twenty seven hundred coins made of lac etc, which finds mention in his report. Further this Stupa remains were identified as Chaliya stupa, where Buddha spent three rainy seasons and near the hill in the Veluvana he preached two suttas of *Sutta Pitaka*. Inside the cave, there are two chambers of 8/8' and 12/11', with height of 7'. Walls of these chambers are smooth polished.

On the middle of this hill towards north facing Shrigarpur village, there are evidences of petro glyphs and few inscriptions engraved on the rock of the hill. Paleographically, these inscriptions are dated 9th c. A.D. and the language of inscription is Sanskrit. Existence of petro glyphs gives us sufficient indications about early settlement of human being in this region. Inscriptions engraved near these petro glyphs were definitely later activity.



**Picture: 7**



**Picture: 8**



**Picture: 9**

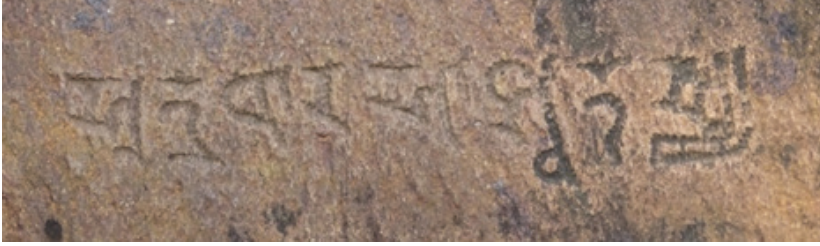
Inscriptions are in early Siddhamatrika characters and Sanskrit is the language. Paleographically they are datable to about 9th century A.D. and indicate very interesting facts of history. In these inscriptions, we get evidence of stone cutter and artisan.



**Picture: 10**



Inscription reads: “*Sūtradhara Purasya*”, in early Siddhamatrika character and Sanskrit language. Paleographically it can be dated to 9th century A.D. It seems to record the name of the artisan as Pura.



**Picture: 11**

Picture 11 reads: “*Sūtradhāra Sā|vatsya*”. Inscription is in early Nāgarī characters and in the Sanskrit language. Paleographically, this can also be dated to about 9th century A.D. The inscription refers to the name of an artisan as Sā|vata.



**Picture: 12**

Inscription reads: “*ūr~ Madha=a (line 1), ūakadha*” (line 2). Period script and language is same as above.



**Picture: 13**

Inscription reads: (line 1) *Jatīdhavalla üilaklūī\*\*a Kavi putra/* (line 2) *Līkhīyanta Gahakēlnāī.* Period script and language is same as above.

The inscription seems to refer to a stone-cutter (ilak@\*\*a) named Jatīdhavalla, son of certain Kavi. The second line probably refers to the name of the engraver as Gahaka.

Prior to these finds from this locality large number of sculptures of Buddhist and Brahmanical religion is reported in various scholars work.

Many of the sculptures are still lying in the nearby villages in an area of around 50 square kilometres unprotected and unguarded. Existence of large number of sculptures in this region was surprising for the scholars because they were not sure from where they have come? Few of them have suggested that perhaps this place was the manufacturing centre for sculptures found in this region.



**Picture: 14**

On the beneath of this hill, towards north one, Vishnu image is engraved in the hill. Stylistically this image can be dated to 9th-10th century A.D.

Besides these engraved images, per glyphs and inscriptions, on the beneath of the hill there are few sculptures of Brahmanical deities which are kept in a temple called “*Ramesvaradham*”. Sculpture of Ganesha, Mahishasurmardini and a Shiva linga is installed inside this temple and worshipped by local people. Stylistically these sculptures suggest their dates as 8-9th century A.D. All the sculpture is made of black basalt stone and except the Linga and Ganesha sculpture all other is 2.5’ in size.



**Picture: 15**



Picture: 16



Picture: 17

### Uren:

The village is situated on the Patna Bhagalpur rail line, between the two important railway stations Kiul and Jamalpur. This village is around 15 km's east from Kiul station. Historical artifacts from this village are reported since 19th century by A. Cunningham (1873), Beglar (1878) and Waddell (1892). Uren has been a significant early historic site showing continuous occupation up to the early medieval phase. Waddell brought to the notice about the significance amongst the Buddhist ruins of Bihar. He described about the Buddhist ruins on the hills which exists south and north of the modern village. He also reported about existence of a Stupa and temple on the top of the hill. Waddell noticed a life size image of Buddha, several inscribed images and votive 'Chaityas' of high artistic merit. On the south eastern side of the summit of a solitary hill near the village Waddell mentions as Lorik-ka Ghar. Lorik is one of the most legendary heroes known to the folklore of Bihar. Waddell also identified here the house of Bakula Yaksha of Buddhist tradition which claims that Buddha ultimately converted the Yaksha.<sup>5</sup>

Besides the colonial writers this site was explored by few eminent archaeologists in modern times. Por. D.K. Chakrabarti has mentioned about this site in his book "*Archaeological Geography of Ganga Plain: Lower and Middle Ganga Valley*".<sup>6</sup> His observations after exploration of the site are "Uren has been a significant early historic site showing continuous occupation up to the early medieval phase." In 2004-05 Prof. R.K. Chattopadhyaya and Dr. Rajat Sanyal also explored the site and published their report by concluding that the occupation of this site is from early period to the middle ages. They have reported finds of BRW, BSW, and NBPW potteries along with microlithic tools, potter's equipments, bone harpoons and fish hooks of early period from this site. They also identified architectural remains of Buddhist and Brahmanical institution remains of early medieval period and discussed about their nature in their article.

In a recent course of exploratory work near the Buddhist monuments mentioned by the previous scholars, few images of votive stupa were found engraved on the hillock where the brick stupa is reported. These engraved votive stupa images suggests existence of worshipper and donor at the site.



**Picture: 18****Picture: 19**

Besides these engraved votives stupa marks in all the directions of the hillock, on the north western side of this hillock few holes for cutting the stone in rectangular way, made by chisel were identified.

**Picture: 20****Picture: 21****Picture: 22**

These holes made by chisels are clear evidence of stone cutting for making sculptures in this region. Lakhisarai as a centre for making sculptures during early medieval period is mentioned in writings of Picron and others but they were not sure that for making those sculptures from where the stone was taken. Common people describe the rock used for making these sculptures were either brought from Gaya or Rajmahal hills. Frederick M. Asher is of the view that the stone used for making sculpture during this period in this region was brought from Matadih quarry near Munger.<sup>7</sup> These marks clearly suggests that the source of stone for making sculpture in this region was Uren because this place is hardly 12 kilometres east from the main centre of activity in this region. Further, the inscriptional evidences about the artisans on the Bicchwe hill strengthen this argument. Evidence for source of stone, scribes/artisans and large number of sculptures clearly suggests that this was a big centre for manufacturing sculptures in early medieval period.

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# “ONE BELT ONE ROAD” INITIATIVE OF CHINA AND INDIAN PERSPECTIVE

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## ABSTRACT

*21st century is being coined as the Asian century. When most part of the world has slipped into economic crisis, India and China are keeping the pace of economic development. Many analysts have described China and India as competitor as well as partners in cooperation. In the context of cooperation and competition dynamics, Chinese initiative of “One Belt One Road” and India’s response to it is being scrutinized critically. China’s “One Belt One Road” is being viewed as the maker of new geopolitical landscape over the world map. How India would contribute into or what role India will opt for, is the issue deliberated upon in this paper.*

**Keywords:** China, India, Most favoured Nation (MFN), One Belt One Road, Project Mausam, Spice Route.

## INTRODUCTION

Dawn of the 21st century started with a lot of significant phenomena. On 9th September 2001, the world’s superpower United States of America was attacked by terrorists and world saw a new war against terrorism which is still being fought. Iraq and Afghanistan saw regime change and whole of Middle East became turbulent. Economic crisis of 2008 had weakened U.S. economically and world has slipped into black hole of economic uncertainty. When the world economy is yet to recover from crises and slowdown, Brexit happened which will have lasting impact on whole of Europe. We may see European Union coming to end in near future. Two Asian giants although seeing considerable growth, are facing a bunch of bottlenecks that is in need of urgent remedy. All these happenings are drawing a new geo-political structure beneath the existing one which requires new approach and policy formation for smooth transition into “New World Order For Twenty First Century” (NWO 21). China being the second largest country in Asia having the highest population in the world, is aspiring to lead the

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world in coming future. But recent slowdown in Chinese growth and the underdevelopment of its hinterland area has dented China's prospect of becoming a world leader. At this crucial time, China's flare up on maritime issues with her littoral countries further worsen China's prospect. All these pressing issues had led Chinese policy-maker to think something afresh that could not only help China's development but also put China in the centre of geo-political structure. China's development in last forty years had been fostered by intense globalization and China understands that the coming phase of development also require accelerated globalization. Keeping in mind the benefits of globalization, Chinese policy makers have drafted the *One Belt One Road* initiative which traverses through Asia to Europe and Africa putting China in the centre.

In September and October 2013, Chinese President Xi Jinping proposed to build new Silk Road on the line of ancient Silk Road to boost the regional economy and provide a bigger market with better opportunities to further their market integration.<sup>1</sup> Chinese President while visiting the Central Asian countries chose Kazakhstan to announce his grand vision of "The Silk Road Economic Belt" strategic initiative and at Indonesia announced "the 21st-century Maritime Silk Road".<sup>2</sup> Under his steer and command, Chinese government has mobilized a huge amount of resources to materialize this grand project. Xi himself had led the dialogue on OBOR project with many Central Asian, European and ASEAN nations. During China-ASEAN Expo in 2013, Chinese Premier Li Keqiang had proposed to strengthen economic cooperation and mutual learning under Belt and Road Initiative of China.<sup>3</sup> This was considered as the first official declaration of building China-Indo-China Peninsula Economic Corridor. In Central Asia, all the countries have readily agreed to collaborate on the project in return of huge Chinese investment in roads, railways, ports, communication and energy. China has promised to build more than 4000kms of railways and 10,000kms of highways with an approximate investment of \$US 16.3 billion. China also promised to invest \$US 56 billion on China-Pakistan Economic corridor which will connect China to Arabian Sea and thus opening a new trade route for China to the Middle East and Mediterranean countries. Maritime Silk-Road initiative again would connect China with all the southeast countries, south Asian countries namely India, Sri Lanka and Bangladesh, and further will go till European nations. All the investment will put China in the centre of global politics, economy and diplomacy at the cost of America. This aspect of OBOR project has given rise to many worries and misunderstanding in many countries. Many scholars, experts of International relations and strategic affairs have written extensively in print and electronic media to mould the impression of people in their respective countries regarding OBOR project. India has seen the same trend since the inception of OBOR project. Many Indian print media had covered extensively on OBOR project. Here, we will discuss the narration of OBOR project in Indian and Chinese public discourse that has appeared in the last three years between 2013 and 2016.

## BACKGROUND

In a rapidly changing geo-political structure of the world, China and India both are striving for faster economic development and increase in their political influence in other regions. New alliances are emerging and old ones are slowly vanishing from the geo-political map. China with its economic strength is looking to reshape the world structure where it can have a better

say. In this regard, China recently has embarked on series of new projects of economic and strategic values. Under this scenario, reportage about the Chinese initiative in print media across the globe is of utmost importance.

The image of any country being molded by the media of other country is of utmost importance while projecting such initiative. Till now China has an image of fast-transforming country that is striving for economic development and uplifting the millions of people from the poverty line. But with the global economic crisis in 2008 and the subsequent slowdown in European and American economy, China is losing its market and has seen a sharp fall in its export. To find new market and keeping the pace of economic development, China needed to reshape its economic strategy. After much deliberation, China's policy makers have proposed the grand vision of The Silk Road Economic Belt and the 21st-century Maritime Silk Road, also known as The Belt and Road (abbreviated B&R), One Belt, One Road(abbreviated OBOR) or the Belt and Road Initiative(in Chinese, it has been termed YiDaiYiLu).

Question arises what actually *One Belt One Road* is? How it could be defined and what is the purpose of this grand initiative? How could this grand initiative be implemented at the global stage? There are many worries surrounding this project and it seems that many of the questions have no answer at the moment. Pictures will be clear may be after two or three years when there would be a visible sign of its impact in world economy and geo-politics. But let us examine OBOR project step by step.

There has been a lot of debate regarding naming of this project. The whole idea of the New Silk Road economic belt and the 21st Century-Maritime Silk Road has come from the Old Silk Road with modern narratives. The Old Silk Road is actually a series of trade route that has been in place for centuries that has contributed in cultural, economic, social and political interaction among various countries. China is considered to be the originating place for ancient Silk Road. In 2<sup>nd</sup> century B.C., Chinese envoy Zhang Qian (164-114 B.C.) went to western region to establish a coalition against Xiongnu confederacy during Han Dynasty, leading to the establishment of Chinese section of old Silk Road.<sup>4</sup> With the opening of western region to Chinese traders, whole of Central Asia and further Europe got connected to China through a series of trade routes. At the same moment, Buddhism from the Indian subcontinent travelled to Central Asia and entered into China around the first century A.D. , further connecting China to South Asia during Kushana's reign. There are many documented evidences that tell us about the trade relations between ancient India and ancient China.

China's southern part was having trade with India's eastern coast too.<sup>5</sup> All these ancient trade routes were named as "Silk Road" by German geographer Baron Ferdinand von Richthofen (1833–1905)<sup>6</sup> in the 19<sup>th</sup> century which has been rechristened as "New Silk Road" in the 21<sup>st</sup> century. In the present global scenario, all these ancient trade routes are required to be revived to further the scale of globalization and economic development. With this motive, China has decided to revive all the ancient trade routes connecting China to neighboring countries. According to the Vision and Action Plan Issued by the National Development and Reform Commission, People's Republic of China, OBOR has envisioned altogether six routes connecting China to the neighboring countries and Europe and Africa. These six economic corridors are China-Central Asia-Russia-Europe(The Baltic), China-Central Asia-West Asia-



Persian Gulf- Mediterranean Sea, China—Southeast Asia—South Asia—Indian Ocean, China-Pakistan-Arabian Sea, Coastal China—South China Sea—Indian Ocean—Europe, Coastal China—South China Sea—South Pacific.<sup>7</sup> According to the World Bank, OBOR initiative encompasses some 70% of world population, 40% of world GDP, some 39% of world land area and 35% of world household consumption. China Office for One Belt One Road mentions that to materialize this project, some 65 countries had agreed in principle to participate in the initiative and 19 Chinese provinces will take the lead from Chinese side<sup>8</sup>. China has recognized some 14 ports along the OBOR which will be crucial for the execution of this grand project. Xinjiang and Fujian are respectively identified as the nodal region for “The Belt” and “The Road” initiative. Both regions have been the centre of ancient Silk Road.

Xinjiang is located on the strategic point connecting China to whole of highland of Eurasia and is also rich in natural resources. Fujian at the eastern coast is providing the free trade zone to attract the business. *Yunnan and Guangxi* province is identified as the region which will play their role as an entry point to the *southeast and south Asian* economic corridor and subsequently helping to the further development of Pearl River economic zone. Shanghai and Guangzhou will be the front ports assisting the OBOR initiative. From south to north, Macau, Hong Kong, Taiwan, Hainan, Guangzhou, Shanghai, Zhejiang all will be the key partners in materializing the whole project assisting in all the four directional business activity. The most surprising part of the project is the inclusion of three provinces from the Northeast part of China, namely Liaoning, Jilin and Heilongjiang. These three provinces would be assisting the Inner Mongolia-Mongolia-Russia Economic corridor. In the hinterland of China, provinces which encompasses Chang-Jiang economic corridor are Hubei, Hunan, Sichuan, Jiangxi, Anhui, Henan etc. which will be actively participating in the initiative. Most of capital cities of China are prepared to get some sort of role to play in the national initiative.<sup>9</sup>

It has been reckoned that there are altogether 65 countries falling on the trade route of “One Belt One Road”. These 65 countries have been enlisted in the below tables falling on six different economic corridors. Table 1-6 enlists the population and GDP of these countries to make a sense of these economies and their importance on these economic corridors.<sup>10</sup>

**Table 1: China-Central Asia-West Asia-Persian gulf- Mediterranean Sea Economic Corridor**

No.	Country Name	Population 2016 estimate	GDP (PPP) 2015 estimate	GDP(Nominal) 2015 estimate
1.	Kazakhstan	17,693,500	\$420.629 billion	\$225.619 billion
2.	Uzbekistan	31,576,400	\$183.933 billion	\$68.190 billion
3.	Turkmenistan	5,171,943	\$93.271 billion	\$35.398 billion
4.	Tajikistan	8,610,000	\$17.555 billion	\$8.572 billion
5.	Kyrgyzstan	6,000,000	\$20.095 billion	\$6.650 billion
6.	Iran	79,2 00,000	\$1.015 trillion	\$419.643 billion

7.	Iraq	38,146,025	\$522.700 billion	\$240.006 billion
8.	Syria	17,064,854	\$107.831 billion	\$59.957 billion
9.	Turkey	78,741,053	\$1.665 trillion	\$861 billion
10.	Jordan	6,800,000	\$77 billion	\$37.52 billion
11.	Lebanon	6,184,701	\$81.122 billion	\$49.919 billion
12.	Israel	8,541,000	\$297.046 billion	\$311.739 billion
13.	Saudi Arabia	30,770,375	\$1.720 trillion	\$653.219 billion
14.	Yemen	25,408,000	\$85.284 billion	\$41.884 billion
15.	Oman	4,441,448	\$173.073 billion	\$59.675 billion
16.	United Arab Emirates	5,779,760	\$667.211 billion	\$375.022 billion
17.	Qatar	2,383,705	\$333.936 billion	\$185.395 billion
18.	Kuwait	4,348,395	\$301.289 billion	\$148.854 billion
19.	Bahrain	1,378,000	\$66.369 billion	\$31.823 billion
20.	Greece	10,955,000	\$290.491 billion	\$195.878 billion
21.	Cyprus	1,141,166	\$27.516 billion	\$23.263 billion
22.	Egypt	92,292,000	\$1.047 trillion	\$330.765 billion

**Table 2 :China-Mongolia-Russia Economic Corridor**

No.	Country Name	Population	GDP (PPP)	GDP(Nominal)
1.	Mongolia	3,081,677	\$36.6 billion	\$12.5 billion
2.	Russia	144,221,341	\$3.685 trillion	\$1.133 trillion

**Table 3: China-Indo-China Peninsula Economic Corridor**

No.	Country Name	Population	GDP (PPP)	GDP(Nominal)
1.	Vietnam	91,700,000	\$593.509 billion	\$214.750 billion
2.	Laos	6,803,699	US\$34.400 billion	US\$11.676 billion
3.	Cambodia	15,458,332	\$50.258 billion	\$16.778 billion
4.	Myanmar	51,486,253	\$311 billion	\$74.012 billion
5.	Thailand	67,959,000	US\$1.152 trillion	US\$409.724 billion
6.	Singapore	5,610,000	\$452.686 billion	\$308.051 billion
7.	Malaysia	31,330,000	\$800.169 billion	\$375.633 billion

**Table 4: Bangladesh- China-India-Myanmar Economic corridor (BCIM-EC)**

No.	Country Name	Population	GDP(PPP)	GDP (Nominal)
1.	China	1,376,049,000	\$20.853 trillion	\$11.383 trillion
2.	Myanmar	51,486,253	\$311 billion	\$74.012 billion
3.	Bangladesh	168,957,745	\$572.440 billion	\$205.327 billion
4.	India	1,293,057,000	\$8.727 trillion	\$2.384 trillion

**Table 5: China-Pakistan Economic Corridor (CPEC)**

No.	Country Name	Population	GDP(PPP)	GDP (Nominal)
1.	China	1,376,049,000	\$20.853 trillion	\$11.383 trillion
2.	Pakistan	201,995,540	\$984.205 billion	\$270.961 billion

**Table 6: Countries along “The 21st century maritime Silk Road”**

No.	Country Name	Population	GDP(PPP)	GDP (Nominal)
1.	Indonesia	255,461,700	\$3.010 trillion	\$936.955 billion
2.	Malaysia	31,330,000	\$800.169 billion	\$375.633 billion
3.	Philippine	100,981,437	\$811.726 billion	\$369.188 billion
4.	Singapore	5,610,000	\$452.686 billion	\$308.051 billion
5.	Thailand	67,959,000	\$1.152 trillion	\$409.724 billion
6.	Brunei	415,717	\$25.245 billion	\$17.060 billion
7.	Vietnam	91,700,000	\$593.509 billion	\$214.750 billion
8.	Laos	6,803,699	\$34.400 billion	US\$11.676 billion
9.	Myanmar	51,486,253	\$311 billion	\$74.012 billion
10.	Cambodia	15,458,332	\$50.258 billion	\$16.778 billion
11.	India	1,293,057,000	\$8.727 trillion	\$2.384 trillion
12.	Pakistan	201,995,540	\$984.205 billion	\$270.961 billion
13.	Bangladesh	168,957,745	\$572.440 billion	\$205.327 billion
14.	Sri Lanka	20,277,597	\$237.791 billion	\$82.239 billion
15.	Maldives	393,253	\$4.935 billion	\$3.228 billion
16.	Nepal	26,494,504	\$74.020 billion	\$24.067 billion
17.	Egypt	92,292,000	\$1.047 trillion	\$330.765 billion
18.	Greece	10,955,000	\$290.491 billion	\$195.878 billion
19.	Afghanistan	33,332,025	\$65.295 billion	\$19.654 billion

In the tables given above, it is quite evident that all the six economic corridors have huge potential for economic development as the population-driven consumer market is huge. China's effort to further integrate the Chinese economy with their neighboring countries and to the highland of Eurasia will further accelerate the pace of globalization, which is the true spirit of *One Belt One Road* Initiative.

## FIVE MAJOR AREAS OF COOPERATION

While there is a growing tendency of de-globalization in the West, *One Belt One Road* provides new impetus to the pace of globalization that requires concerted effort at the multilateral level. To establish a framework for this cooperation at the intergovernmental level, five broader areas have been notified. These include, *inter alia*, Policy coordination, Facilities connectivity, Financial integration, Unimpeded Trade and People-to-People Bonds.

*Policy coordination*: To enhance mutual political trust between the governments, it is necessary to share ideas about developmental policy at the different levels of governments and thereof establishing mechanisms to coordinate for economic developmental policies.

*Facilities Connectivity*: To realize *One Belt One Road* initiative in its entirety, connectivity is paramount. Therefore, Vision and Action plan of *One Belt One Road* emphasizes on the better infrastructure along whole of the *One Belt One Road* Economic Corridors. To achieve optimal connectivity, China is willing to invest huge amount of money (some estimates say 1.4 trillion US\$) on infrastructure building and in doing so providing the much needed impetus to the economic development in various sub-region of Asia, Africa and Europe.

*Financial Integration*: Financial integration is the most important part of this Asia's own Marshall Plan. Currency stability system, investment and financing system and credit information system in Asia will be given priority. Strengthening and developing Asian Infrastructure Investment Bank and BRICS New Development Bank, creating Shanghai Cooperation Organization (SCO) financing institution and operationalizing Silk Road Fund are some areas that have been notified.

*Unimpeded trade*: China would work for the removal of trade barriers among the countries and regions coming along the *One Belt One Road* corridors so that a conducive environment can be created for better trade. Investments and free trade zones will be priority.

*People-to-People Bonds*: China had a vision for overall people-to-people contacts among the different countries. China had proposed to make cooperation on non-governmental levels, like organizing film festivals, cultural festivals, exchanging youth delegation, media delegation, funding in poverty stricken areas for their welfare and providing huge number of scholarships to the students of countries coming along the *One Belt One Road*. People-to-People bond will certainly create a very cooperative ambience that would eventually help in promoting *One Belt One Road* initiative.<sup>11</sup>

## CHINESE PERSPECTIVE ON OBOR PROJECT

**Overcapacity**: China has overcapacity in manufacturing and foreign reserve. To use this capacity, China needed a grand project like OBOR. China's foreign reserve touched US\$ 4 trillion. China intends to use the accumulated reserve to develop necessary infrastructure to

expand market and regional integration of local markets.

**Resource Acquisition:** China's oil and gas resources are highly dependent on overseas markets. *One Belt One Road* will safeguard China's future demand of energy and will consolidate China's economic development for a considerable time.

**National Security:** OBOR initiative is also meant to strengthen China's national security. Western region has been volatile due to acts of terrorism and separatism. With this initiative, China will not only develop economic prosperity but will also boost national security in these border areas.

**Trade Initiative:** China is the second largest economy in the world and second fastest growing economy in Asia after India. China has become a manufacturing hub of the world and had built up overcapacity in manufacturing and infrastructure building. With OBOR initiative, China will have larger saying in more trade initiative which will help both the regional as well as the Chinese economy.

**Transportation Network:** With a series of Railways, Highways and pipeline, China will connect to all of the neighboring states as well as distant Europe and Africa which will help China leveraging her manufacturing might at her will.

## SOURCES OF FUNDING

**Silk Road Fund:** China established a Silk Road Fund on 29 December, 2014, in Beijing with US\$40 billion capital fund. This capital funding will be invested by State Administration of Foreign Exchange (65%), China Investment Corporation (15%), Export-Import Bank of China (15%), and China Development Bank (5%). This funding mechanism would provide funding for infrastructure building, resources and energy development, industrial capacity cooperation and financial cooperation in countries along the belt and road.<sup>12</sup>

**AIIB:** The Asian Infrastructure Development Bank was established on 29th June, 2015. There are 57 founding members of this bank. It was established with initial 100 billion US\$, in which India is also a core member. As this bank is responsible for funding of OBOR initiative, India is in fact indirectly involved through this institution in OBOR project.<sup>13</sup>

**SCODB:** New Development Bank (NDB) or BRICS Bank is a multilateral Development Bank established by the five BRICS nations in accordance with the Agreement on New Development Bank signed on 15 July 2014 in Fortaleza, Brazil. The NDB has an initial authorized capital of USD 100 billion and initial subscribed capital of USD 50 billion of which USD 10 billion will be paid-in capital. The initial subscribed capital is equally distributed amongst the founding members. The purpose of the Bank is to mobilize resources for infrastructure and sustainable development projects in BRICS and other emerging economies and developing countries, complementing the efforts of multilateral and regional financial institutions for global growth and development.<sup>14</sup>

## INDIA'S PERCEPTION ON *ONE BELT ONE ROAD* (OBOR)

India's response to the Chinese initiative of "*One Belt One Road*" has been a subject of intense debate in academia, think-tank and media circle. For Chinese academia, media and

think-tank, India's response is a matter of utmost importance. Whether India joins it or not, both ways it is going to have a lasting impact on not only Sino-India bilateral relationship but also on overall geostrategic landscape of Asia. India herself would be hugely impacted in both the scenario. Given the enormity of this Chinese initiative, India has had to weigh both the scenario with utmost sincerity. This paper would try to delve into India's overall response and its pros and cons in both scenario.

Since ancient times, connectivity has been the key to any country's economic development. India and China has been known for their connectivity driven economic, social, and cultural development. China's ancient Silk Road and India's ancient Spice Road all have a huge contribution to both the countries and other regions. In modern times, both India and China has been trying to attain their goal of development riding on the tide of globalization. At the advent of 21st century when whole world is witnessing a drastic change, China and India both have adopted new initiative which is based on connectivity projects. In this context, the famous quote of former Indian Prime Minister Manmohan Singh back in January, 2007 while addressing the industrial body FICCI in New Delhi, is quite apt. He said "*I dream of a day.... one can have a breakfast in Amritsar, Lunch in Lahore, and dinner in Kabul. This is how our forefathers lived. That is how I want our grandchildren to live.*"<sup>15</sup> This famous quote of Dr. Manmohan Singh is although said in context of India-Pak relationship but the place and timing had a deep strategic underpinning. India has long been striving for greater connectivity and further regional integration to achieve respective development goal. The old Grand Trunk Road (GT Road) which traverse through east to west in Indian subcontinent connects Sonargaon in Bangladesh, passing through the vast Gangetic plains up to Peshawar in Pakistan and beyond. This road has been the backbone of economic activity across the Northern India connecting it to Pakistan, Afghanistan and up to Central Asia. With the partition of India and never-dying enmity between India and Pakistan left a deep imprint on India's economic activities in the region. This is why India has adopted "Look East Policy" (LEP) long back in 1990s, now renamed as "Act East Policy (AEP)" under the Modi government. Under these policies, India is strengthening her connectivity to the eastern nations.<sup>16</sup> Ganga-Mekong cooperation is an initiative by India and five ASEAN nations, namely Cambodia, Lao PDR, Myanmar, Thailand and Vietnam, launched in 2000 at Vientiane, Lao PDR, for cooperation in tourism, culture, education, transport and communication as well.<sup>17</sup> The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising seven member states lying in the littoral and adjacent areas of the Bay of Bengal constituting a contiguous regional unity. This sub-regional organization came into being on 6 June 1997 through the Bangkok Declaration. Out of the 7 members, five are from South Asia, that includes, *inter-alia*, Bangladesh, Bhutan, India, Nepal, Sri Lanka, and two from Southeast Asia, including Myanmar and Thailand.<sup>18</sup> India-Myanmar-Thailand Trilateral Highway project was conceived back in 2002. Through all these regional initiative, India has been pushing for regional connectivity and market integration. Under Ganga-Mekong Cooperation initiative, India-Myanmar-Thailand (IMT) Trilateral highway was first pronounced at the Trilateral Ministerial meeting on transport linkages in Yangon in April 2002. Although this highway is still under construction but, it is expected to be completed by 2020. This highway has been viewed as a huge boost for regional commerce and trade.<sup>19</sup>



India has also been exploring the possibility of trade route to China but it was more or less confined to border areas especially Tibet. But because of political trust deficit and regional complexities, it has never become a grand initiative on both sides. Although India and China has envisaged Kunming-Initiative in 1999 which was later rechristened as BCIM forum in 2011. Kunming Initiative was a Track-II initiative which became Track-I initiative only in 2013 when Chinese Premier Li Keqiang first discussed this initiative with Indian counterpart Dr. Manmohan Singh while visiting India. In this high level discussion, both nations have agreed to explore the possibilities through such initiatives. On 22 Feb. 2013, a convoy of twenty cars travelled all along from Kolkata to Kunming via. Bangladesh and Myanmar. Before that, a car rally was organized from Kolkata to Kunming in 2011. All these groundwork was intended to show the physical feasibility of this corridor. In December, 2013 India-China-Bangladesh-Myanmar held first joint study group in Kunming to discuss the feasibility of this project.<sup>20</sup>

India's official response to the *One Belt One Road* has been very vague in nature. China at her part had raised the *One Belt One Road* initiative at the highest level discussions with Indian counterparts. First during the 17th round of border talks between the Special Representatives of the two countries in New Delhi on February 11, 2014, Chinese State Councillor Yang Jiechi extended an invitation to India to join Maritime Silk Route to India's National Security Adviser Shivshankar Menon<sup>21</sup> and then again on the official visit of Indian Vice-President Hamid Ansari to China in June 2014, China did raise the *One Belt One Road* Initiative and Vice-President asked for more details on the initiative so that India could study it in its fullness to have an official version on the project.<sup>22</sup> Then again Chinese President Xi Jinping had raised OBOR with Prime Minister Narendra Modi, when they met for the first time on the margins of the BRICS summit in Fortaleza, Brazil, in July, 2014.<sup>23</sup> But since then there were no official comment on the initiative from Indian side. It was only on May 13, 2015, on the eve of Indian Prime Minister Modi's State visit to China, India's Foreign Secretary S.Jaishanker while replying a question said "*It is their initiative, so I think it is not for us to welcome it or not welcome it. It is something which is there on the table. To the best of our knowledge we have not really had a detailed discussion on this subject.*"<sup>24</sup> Again on 20 July 2015, India's Foreign Secretary S.Jaishanker while addressing a conference in Singapore said, "*it is not incumbent on other countries to necessarily buy into such unilateral initiatives.*" From his remark, it can be presumed that India sees OBOR initiative as a National Chinese initiative.<sup>25</sup>

India's responses to such initiative whose physical interface are mainly a series of economic corridor are vague because the very concept of such economic corridor is not clear. What would be the role, nature and scope of such economic corridor is still not clear and India is wary of its future role. Given the ambiguity of such an Asian Marshall Plan, India has adopted wait and watch attitude so that it can bide some time for crafting her own role in such initiative. Ancient Silk Road was a phenomenon which happened without any deliberate attempt or concerted state policy but the new initiative is a state sponsored initiative with a well thought policy framework which in itself is the positive and negative side of the Initiative.<sup>26</sup>

### **1. Indian Perspective of China-Pakistan Economic Corridor (CPEC)**

India's opposition to CPEC is very clear. There are many factors that have led India to oppose this part of *One Belt One Road* initiative. First, CPEC passes through Pak-Occupied

Kashmir which is a contested region between India and Pakistan. Theoretically and technically India can't agree to CPEC. Agreeing to this project would mean that India tacitly would denounce her claim over Pak-Occupied Kashmir. So India is against this part of the OBOR. Secondly, India doesn't consider CPEC as merely an economic corridor, but do have some strategic significance. It is true that China will get an alternate trade route to Arabian Sea which will boost development of China's landlocked western region. But then amount of money being invested in China-Pakistan Economic Corridor is disproportionate to the projected profit of this project. The strategic significance which outweighs the economic significance of this project makes India worry. It is also at a time when India is literally at war with Pakistan and China had chosen to ignore India's sensitivities. This has led India to invest in Chabahar port in Iran.<sup>27</sup> Thirdly, CPEC also alters the very basic foundation of Indian sub-continent which sees Pakistan as its constituent member. With CPEC, Pakistan no longer sees itself as a part of Indian subcontinent, although geographically located in the subcontinent. It would see itself strategically with China and culturally in West Asia. This brake in their very identity would have a lasting impact on the whole of Asia. Partition of India have disconnected India's trade and socio-political interaction with West Asia, Central Asia and Russia to the great extent by denying direct land access to these regions. With inclusion of China to this region, it would firmly denied any reconciliation to the direct land access to India as many analysts believe in India.

China has always maintained that CPEC is an important part of *One Belt One Road* initiative, and is an open initiative. China would like to discuss the possibility of including third party with consultation of Pakistan. But there is bleak possibility of India joining CPEC in near future. Given the fact that Pakistan has repeatedly denied India trade transit route to Afghanistan and had not given Most Favored Nation (MFN) Status to India, it is unlikely that India will buzz on it. But on the fling side, if China-Pakistan genuinely invites India to join the corridor and India responds positively, India could reap a lot of benefits. India will not only get a direct land transit route to Afghanistan and Central Asia but will also improve bilateral relationship between India and Pakistan which could genuinely help in realizing the Asian dream.

## **2. Indian Perspective on Bangladesh-China-India-Myanmar Economic corridor (BCIM-EC)**

Bangladesh-China-India-Myanmar Economic Corridor (BCIM EC) is a K2K (Kunming-Ruili-Bhamo-Lashio-Mandalay-Tamu-Imphal-Sylhet-Dhaka-Kolkata) route, which is 2,800 km long and mostly along the old Southern Silk Road.<sup>28</sup> This project has come into being a decade and a half ago when Kunming Initiative was introduced. In 1999, both India and China felt the need for more collaboration on border trade and started dialogue on opening up of borders. But this initiative was more at provincial level and didn't figure much at policy framework at central level.<sup>29</sup>

Now when China has pronounced *One Belt One Road* initiative, it has incorporated BCIM EC in this initiative. BCIM Economic Corridor is most advantageous economic corridor among all sections of OBOR initiative. CPEC till now is confined to China and Pakistan only. But India, Myanmar and Bangladesh constitute a much bigger market in South Asia than any other economic corridor. Natural resources in Bangladesh and Myanmar have not been tapped

yet and provide a huge opportunity in these areas. It will also help India in its *Act East Policy* initiated by Modi Government.

### 3. Indian Perspective on 21st century Maritime Silk Road

Given the geographical positioning of India, India has shown greater interest in *The Road* part of the initiative. India has deep trade, commerce, tourism, and cultural relationship with the Indian Ocean littoral states and Southeast Asian countries. Given India's deep strategic interests in the Indian Ocean region, it is inevitable for India to be a part of the initiative. India's own policy orientation and ambition has caused this prolonged mulling over the strategic gain and loss over the issue. Realizing the role of India in the Indian Ocean, China had invited India to participate in the Maritime Silk initiative.<sup>30</sup>

India has long seen Indian Ocean as its sphere of influence and so regard herself as the prime player in the region. But the rise of China and her ambition to expand in the Indian Ocean region has made India uncomfortable. Although India's response was cautious but it did take some counter-measures like initiating *Project Mausam* and the recently talked *Project Cotton Route*. India's lack of resources and her inability to invest in the littoral countries had left these countries with no other options but to accept China's huge aid and investment. India should also adapt her own policy and make her more accommodative and join the initiative. Joining the initiative may help India in trade, commerce and other economic activity. On China part, China should also make effort to mitigate India's concern on strategic front. China's construction of Hambantota port in Sri Lanka and frequent visit of Chinese submarines to Indian Ocean has raised India's concern.

### 4. Growing Chinese influence in Indian subcontinent

India is also wary of the growing Chinese influence in the Indian subcontinent. The huge amount of Chinese aid and investment in its neighborhood, especially Nepal, Bangladesh, Sri Lanka and Pakistan forces India to take counter-measures. Although these aids and investment are not going to alter the Indian social-political, cultural and economic influence on these neighboring countries in near future but it does challenge Indian supremacy in South Asia. On the flip side, China and India has huge trade deficit. China also does less investment in India compared to its other neighboring states. This strategy fuels the theory of encirclement of India by China and many analysts have coined this encirclement as "String of Pearls".

### 5. China-Pakistan nexus

Indian policy makers are also very concerned regarding China-Pakistan nexus because it has deep impact on Indian presence in Afghanistan. Indian trade with Afghanistan and Central Asian region and subsequently With Russia has been hampered because of partition of India. Pakistan has repeatedly denied India's request for a direct land transit trade route to Afghanistan and Central Asia. Indian outbound trade has been badly affected with this cut-off. Almost whole of North India has no outbound business activity with any other nation. This has badly affected the development of northern Indian States.

### 6. Trade Deficit

India's annual trade deficit with China increased to USD 52.69 billion during 2015-16 from

USD 48.48 billion in the previous financial year, as per reports. Such a voluminous amount of trade deficit between India and China had made such economic corridor more desirable but then China's upper hand in manufacturing and overcapacity in steel, cement and machinery restrains India from taking a lead in such initiative. India expects more investment from China to address this issue. Year 2017 will be crucial for Sino-India relationship as both countries are emphasizing on enhancing trade.

## **7. India's own connectivity- driven foreign policy**

India has also initiated its own connectivity project for trade and commerce. Last year India signed a cooperation agreement with Iran to develop Chabahar port in Iran and connecting it through highways to Afghanistan. India has contributed in building Zaranj-Delaram highway section of this Highway project. This Highway gives India unfettered passage to the Central Asia up to Almaty in Kazakhstan. India is also a member of International North-South Transit Corridor (INSTC) which was initiated long back in 2000. India, Iran, Russia, Turkey and Central Asian countries all are member of this multi-modal links which connects India to Eurasia. A dry-run was conducted in 2014 to check its viability and transit and customs agreement was signed in 2015. India has already acceded to the Ashgabat Agreement which facilitates the transportation of goods from India to Central Asia, Persian Gulf and Eurasia.

*Project 'Mausam'*: Ministry of Culture in India has launched its unique project on 20th June, 2014 at the 38th World Heritage Session at Doha, Qatar. The underlying idea behind this project is to re-explore the cultural routes and maritime landscapes in Indian Ocean littoral countries and in the process re-connect with these coastal countries and establish a mutual understanding of shared culture and values that had shaped our destiny in the long historical process.

*Spice Route Project*: India has also launched Spice Route project which will connect her to 31 countries lying along the ancient Spice Route. The centre of this project is India's southwestern state of Kerala which is major producer of world famous Indian spices. Kerala has maritime trade with more than thirty countries and India wants to reorient her relationship with these nations through trade, tourism, historical and cultural exchange.

China has expressed its desire to connect its *One Belt One Road* initiative with India's spice route project and *Project Mausam*.

## **8. India's Own Aspiration of Emerging As a Superpower**

India after independence has changed a lot. It has been persistently trying to regain its place in the world as a great country. No doubt, India is seen as a civilization but not as a great power. After economic reforms, India is slowly getting better economically and also improving on many social parameters. In South Asia, India undoubtedly is seen as a big country but has not been able to provide the much needed economic support to these small countries. On the diplomatic front, India has always maintained a non-aligned policy which restrained India from being a part of any bloc or alliances. India's non-aligned policy is also one factor which is playing its role in deciding India's approach towards Chinese OBOR initiative. If Chinese initiative is to tackle US pivot to Asia or in response to US Trans-Pacific Partnership, then

obviously India won't want to see herself as a member in these strategic bloc. India has its own priority which requires a balanced approach. It is mainly driven by India's own need for development and relationships with many countries. But then strategic considerations apart, on economic front, India could consider to engage in Maritime Silk Road Initiative without giving any strategic color to its involvement.

## 9. China's Opposition to India's Entry in NSG and UNSC

China's reluctance to support India's inclusion in the United Nation Permanent Security Council has made India disappointed. Recently India sought support of China for her membership in the Nuclear Suppliers Group(NSG) . China is still not forthcoming. China even doesn't support India's move to ban Jaish-e-Mohammad commander as a terrorist through the 1267 Resolution of the United Nation. This entire uncooperative attitude has created a non-conducive environment for India to accept any such Chinese Initiative.

## SOME ARGUMENTS FOR INDIA TO JOIN OBOR

*Economic benefits:* India should join OBOR to reap economic benefits from the project. India is in need of huge infrastructure build-up across the country which can be facilitated by China. China's overcapacity in infrastructure building can become a boon for India. India may weigh options to readjust its view on OBOR from strategic to purely economic perspective.

*Strategic Benefits:* By joining OBOR, India would have much bigger say in the foreseeable future of strategic structure in Asia. India's biggest concern on OBOR is the CPEC section of this initiative, and India may envisage participating in this initiative. Prof. Li Xiguang of Qinghua University has suggested that India and Pakistan can come on term with the concept of Soft Border as was in the discussion between Indian PM Manmohan Singh and Pakistan President Pervez Musharraf. If India-Pakistan can agree on the principle of Soft Border, then it would be easy for India to join the initiative. Once India formally joins this section of OBOR, then India will be involved in other sections of OBOR actively. This would also help India reduce strategic burden by becoming a stakeholder in Pakistan and so working together on economic front. But, this is unlikely as India may seek application of same principle to the northern neighbor where India's civilizational heritage of Mt. Kailash- Mansarovar Lake lies.

China may offer India negotiation for its involvement in the "*One Belt One Road*" initiative with support for the Permanent Membership in the United Nation Security Council as well as NSG membership. China should rethink over its earlier position and ought to agree to India being a Permanent Member of the United Nations Security Council. This will earn a huge goodwill for China among 1.3 billion people of India. Young India is very aspiring and leaving no stone unturned to keep the pace of change and economic development. China having gone through the same process should respect the sentiment of young population of India.

*Civilizational Tie-up:* India and China has had more than two thousand years of civilizational tie-up which makes them unique in whole of human civilization. The formidable Himalaya has not stopped establishing a deeper cultural and humane relationship between these two countries and have mutually affected in many ways. China and India are countries, as put by famous cultural ambassador between India and China Ji Xianlin, as "*Created by*



heaven and constructed by earth” which wielded considerable amount of mutual influence not only in their mainland region but also in whole of Indo-China region. Most of the Southeast Asia has been the product of mingling of these two civilizations. India must seize this golden opportunity to contribute in the making of new Asia.<sup>31</sup>

## CONCLUSION

China is spending such a large amount of money and resources, undoubtedly it is for economic development, but then question arises whether China should abstain from gaining strategic leverage from this initiative. It is a historical fact that the ancient Silk Road emerged out of strategic necessity. Or should the world be afraid of China’s peaceful rise? Since last three decades, China has proved its ability to lead with example. China is a civilization with deep cultural values and mutual respect for other nations. China has always played a very positive role in promoting peace and stability in whole of Asian region and contributed immensely to the human civilization. With Chinese prosperity and able leadership, can other major players of the world cooperate with China to get rid of many world problems? World is facing acute problems like climate change, poverty, terrorism, and economic crisis etc. and these need to be sorted out at the earliest. All major players must pull together to address global problems. China, too, shall be part of this benign global effort.

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# INTERPLAY OF RELIGION & POLITICS IN LADAKH

Lobzang Chosdup\*

## ABSTRACT

*The paper attempts to analyse the interplay of religion and politics in Ladakh. The region of Ladakh has been influenced by two major religions, Islam and Buddhism. The paper focuses only on the role of Buddhist Monasteries in politics and does not deal with the role Islam plays in the politics of Ladakh. At the outset, it analyses the role of religion in politics ever since Ladakh was politically integrated under the new structures and institutions of the Jammu and Kashmir state following overthrowing of monarchical form of government. Further, the history of participation of religious leaders in the political processes has been delineated. These leaders also articulated the regional aspirations of Ladakh. It examines the role of Ladakh Buddhist Association (LBA) in the politics of Ladakh, how secular leaders have used religious organisation like LBA for vote bank politics, personal interests and communal agendas. It looks into how the post-Lama leaders used religious sentiments for political interests and power during elections. Lastly, the paper argues about the changing role of religion in politics, the emergence of confrontation between politicians and monks as well as change of LBA's role from politics to more religious and social work.*

**Keywords:** Autonomy, Bakula Rinpoche, culture, democratisation, identity, Ladakh Hill Council, LBA, religion, sectarianism, secularism.

## INTRODUCTION

With the emergence of nation-state as a sole political organisation, political institutions and processes has been secularised by separating temporal and spiritual aspects. Before nation-states, religion played decisive role both in public and private affairs of individuals. In the western world, Church assumed this role and influenced every aspect of society and state. During medieval period, kings were the only sources of authority projected as directly derived from God. Unquestioning obligation and obedience of the masses were the prevailing charac-

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teristics. With times, all these prevalent practices changed and transformed from absolutism or feudalism to liberalism or democracy. Belief in rationality and reason began to challenge the orthodox belief and power of the kings. Consequently, democracy and constitutionalism was established in most of the western world, later adopted by newly independent countries in 20<sup>th</sup> and early 21<sup>st</sup> century. Nevertheless, despite the separation of religion from politics, the former continues to play significant role in politics in many parts of the world particularly in the South Asian and West Asian Countries.

India has diverse religion, culture and language. Freedom fighters and Constituent Assembly members adopted secularism as one of the ideals for governance of an independent India. Secularism being a western concept has been modified to suit India and hence the meaning of Indian secularism differs in both theory and practice. The Constitution of India defines India as a secular country while recognising the existence of various religions. The major religions of India are Hinduism, Islam, Sikhism, Buddhism, Jainism, and Christianity. Despite India being a secular state constitutionally, religion plays significant role in shaping and influencing the local, regional and national politics and more often India's external relations. Therefore, post-independent politics of India has been characterised by the relationship between religion and politics. Religion plays important role in state politics, e.g. Sikhism in politics of Punjab, Hindu and Muslim confrontational politics in the state of Jammu & Kashmir etc. Thus, like state and national politics, religion is a significant factor at meso or regional level. In Ladakh, where both Buddhist and Muslim communities live in close interaction, religion plays a major role in politics.

### **POLITICS OF LADAKH WITH KASHMIR: ROLE OF HEAD LAMAS**

Despite being a part of J&K state, Ladakh has played no significant role in internal political dimension and external political dimension; it has been deliberately marginalised and ignored by national and regional political forces of Jammu & Kashmir. However, from the beginning Ladakh put its own perspective by claiming that the region is different from the state geographically, culturally and religion-wise. Politically, it has played a vital role by demanding autonomy and separation from the state within the framework of Indian constitution for the Ladakh region. But the moot question to be addressed in this paper is the influence of religion in politics of Ladakh. Several queries need to be explored as to why did Head Lamas (reincarnate monks) participate in the politics?

Variegated politics of Ladakh is not immune from religious influences. Important head monk always played key role since independence of India or after the restructuring of J&K state under the Kashmiri leader, Sheikh Abdullah. Nevertheless, the role of Buddhist head monks and their participation in politics of Ladakh was more by default than by choice. There could be different reasons for the participation of Lamas in the politics of Ladakh. It could be due to the lack of secular leadership during those times who could manage whatever the political capital required from Ladakh at the initial stage. It could also be because of the fact that Kashmiri leadership found it convenient to use the Lamas for political manipulation in order to retain their hold on Ladakh politics. Nonetheless, the role of spiritual leaders in politics has been highly appreciated and deeply acknowledged by people at large. Historically, like the Tibetan politics, religion has been the most important determinant of identity, culture and way



of life for the people of Ladakh particularly the Buddhist community.

One could imagine the difficulty they had to go through to be in politics keeping in mind the dominance of Kashmir-centric political leaders, institution and structures of the state. However, it is clear that the monks were able to project Ladakh's regional identity more successfully within J&K politics. For example, the tallest leader Kushok Bakula, despite his limitations on several fronts, was able to uphold Ladakh's regional interests more vociferously even under those difficult political circumstances and Kashmir's monopoly. Under his leadership, Schedule Tribe status, Ministry of Ladakh Affairs and other regional issues were articulated strongly and clearly. As a result, Kashmiri leaders promoted other lamas to challenge Bakula's popularity as well as supported leaders from Kargil in order to counter Buddhist leaders of Leh. Nevertheless, these religious heads had not only protected the interests of religion (*Chos*) but also politics (*Srid*) of Ladakh region during those times.

During the initial phase, rather than appealing on religious sentiments, religious leaders themselves actively participated in politics of Ladakh. The people did not challenge monks' legitimacy and leadership in politics and the reason could be their high status in monasteries and society. Interesting features during those times were political confrontation between the Bakula versus other head lamas instigated by the Kashmiri leaders. The leaders from Kashmir not only divided the monk leaders of Ladakh but also divided Leh and Kargil on religious basis. Hence paving a way for communalisation of politics of Ladakh and emergence of other leaders and active participation of organised religious bodies like the LBA.

### **POLITICS OF LADAKH AND ROLE OF LBA**

Ladakh Buddhist Association (LBA) has played an important role in the politics of Ladakh. Its origin can be traced back to the communal division of Jammu & Kashmir between Muslims and Kashmir's Hindu Pandit community. It was formed at the instigation of Kashmiri Pandits in order to preserve cultural and religious identity of Buddhist community of Ladakh from the cultural penetration of Kashmiri Muslims. The LBA depended upon its Buddhist identity to protect the interests of Ladakh against Kashmir. In the processes, it organised different movements, demonstration and protests demanding Union Territory (UT) status for Ladakh. It had regularly presented memoranda to the central government. While demanding autonomy and the UT status for Ladakh on religious lines, it communalised the political character of Ladakh. Leaders from Kargil suspected the majoritarian politics led by LBA and in response demanded Greater Ladakh instead of supporting the demand for a UT. Apart from being a religious organisation, LBA has been active as a political organisation as well. It has become platform for the young leaders to join politics and most of the leaders of LBA have become politicians. Majority of the present leaders of Ladakh particularly Buddhist had long association with LBA. The LBA, therefore, has played an important role in shaping the political discourse of Ladakh.

LBA has also played significant social and religious role for the benefit of the Buddhist community. It organises religious teachings, observes Buddhist occasions and initiates social gathering like Losar (New Year). Despite all these, it has been criticised for communal practices, moral policing against the younger generation and creating problems for social

harmony. As per teachings of the Buddha, a Buddhist or a Buddhist organisation must adhere to the concept of non-violence and compassion. On the contrary, LBA despite being a religious organisation practices communalism and moral policing to “protect” the Buddhist community’s interests. It does not allow inter-religious marriage and girls marrying non-Buddhists are boycotted socially. Some have criticised it for associating with Hindutva forces like RSS and the VHP.

## **RELIGION AND POLITICS: POST-LAHDC**

LBA as a platform for communal politics resulted into emergence of new leaders. They emerged from large mobilisation for movement demanding separate political status and communal tension in Leh.

After the establishment of the Hill Council, an autonomous body particularly known as the Ladakh Autonomous Hill Development Council (LAHDC), politics of Leh-Ladakh came under these new leaders. Under their leadership, interplay of religion and politics emerged in different forms. During this period, the head lamas like Bakula Rinpoche retired after serving as an Ambassador to Mongolia and other head lamas did not take interests in politics. As a result, these new leaders began to use religious sentiments as well as head lamas and monasteries for political gains indirectly. With the passing of time, somehow these leaders have reached a consensus to fight for the larger cause of Ladakh by forming Ladakh Union Territory Front (LUTF). This unity among the leaders stood as an example of peaceful coexistence and social harmony within the region. It might have been due to the understanding that political processes of Ladakh did not require religion for political mileage and personal interests at least in the region. Nevertheless, priorities of leader’s interests overshadowed the larger interests of region resulting into political degeneration in Ladakh. With the dominance of new leaders of regional political scene, religion again became significant factor for influencing the political activities of region. They began to use not only religious sentiments and head lamas but also diverted state and central government schemes to the monasteries in different villages. Providing funds to monasteries became new political development in the politics of Ladakh as monasteries are attached with peoples’ religious sentiments. Instead of articulating regional issues against the Kashmir valley, sub-regional issues within Leh and Leh-Kargil began to dominate the political discourse of Ladakh.

There is no regional leader as such in Ladakh today, instead many sub-regional leaders have emerged both in Leh and Kargil particularly through communal platforms and due to indirect use of religious institutions. Rather, these leaders have formed strong linkages with religious institutions both in Kargil and Leh for their respective power politics. During current period, instead of directly participating in electoral fray or politics, political leaders use Rinpoches and clergy for election campaigns as star campaigners to buy and get votes from public and consolidate their hold. They even surreptitiously used high religious lamas including Tibetan refugee lamas for meeting their political ends. Thus, many witnessed political funding of monasteries instead of schools and hospitals by political leaders. Religious institutions were rampantly allowed to grab public land instead of allocating for developmental purposes. Therefore, the use of religion for negative and narrow political purpose has been a new phenomenon for all the negative consequences for Ladakh during this period.

From this understanding, none of the contemporary leaders seems to be pursuing the regional interests. Instead, they used the popular slogan of UT movement and even the Hill Council structure for individual growth and interests. They invariably sold off regional interests for personal interest to be in power, into the power structure in Srinagar or in the Parliament. The irony has been that the use of religion got more intense when political affairs came under the sway of the neo-elitists of Ladakh and secular and modern educated leaders. They are, in fact, able to manipulate religious forces much shrewdly than head lamas or other previous leaders. As a result, politicisation of religious institutions has inevitably led to both communalization and sectarianization of Ladakh. It is becoming a serious problem that could threaten the basic social fabric of Ladakh and would lead to serious confrontation between religion and politics in the political landscape of Ladakh as well.

### **CHANGING DYNAMICS**

Hitherto the relationship between religion and politics in Ladakh has been like give and take. When there were no secular leaders, people whole heartedly acknowledged the head lamas' role in politics to serve regional interests. After the emergence of new leaders, use of religion and head lamas continued for political gains and in return, leaders funded monasteries. This kind of equation was maintained between these secular and religious forces. Now this equation begins to change by asserting each other interests. This phase is dealt with the changing dynamics of relationship between religion and politics in Ladakh.

The recent political development in Ladakh has seen the emergence of BJP. The BJP won both Hill Council election and Parliamentary seat of Ladakh for the first time in the political history of Ladakh. One can argue that the reason for the emergence of this force supported by locals is due to the failure of the then secular ruling party and representatives of Ladakh. However, it is also the result of clash of interests among the newly emerged leaders. As a result of it, the agenda hitherto at state level propagated by LBA has been overtaken by the BJP, transcending communal character of Ladakh within sub-regional and regional to national level. The current MP of Ladakh after his first term as MP remained under hibernation for long until he introduced the BJP in Ladakh by joining it. He claimed that UT for Ladakh could be achieved under the BJP regime or party which supports for the trifurcation of the state and abrogation of Article 370 dealing with the state of Jammu & Kashmir and Centre.

Introduction of BJP in Leh and its challenge to the congress leaders of Hill Council and others had implication on the working of LBA because of its long association with Congress leaders in power in the Council. However, LBA continues to support the UT movement and other political issues of Ladakh. Compared to its earlier role, it has now shifted its emphasis from politics to social and religious welfare of the Buddhist community. It organises different religious teaching of different sects in the region. One important development clearly shows that with the emergence of BJP in Ladakh, LBA has lost its long association with the RSS and the BJP. The other negative upheaval in the region of Ladakh is the emergence of sectarianism among the Buddhist sects, a prevalent practice in the politics of Tibet. It has influenced and created divisions of politics and in the society of Ladakh. On sectarian basis, people started voting the candidates during elections. The LBA was directly responsible for sowing the seed of sectarian rift when it took one-sided approach to the visit by Karmapa Thaye Dorje last year.

However, the head lamas, as said above, are not engaged directly in politics of Ladakh after secular politicians emerged on the political scene of Ladakh. They are now more engaged in religious teachings and environmental issues rather than political issues. These are clearly seen from the activities of Gyalwang Drukpa Rinpoche and H.H. Digung Skyabgon Chechang Rinpoche. However, they are not born in Ladakh but based in Ladakh, so they are different from Bakula, Tokdan and Thiksay Rinpoches. The hitherto relations between religion and politics of Ladakh are slowly changing for different reasons. It is no doubt that the monasteries of Ladakh are traditionally rich compared to other institutions in terms of philosophy, wealth and property. Opening of tourism sector in Ladakh region has further increased importance and wealth of monasteries. In fact, most of the western tourists are attracted by these rich heritages of monasteries and Buddhist philosophy. Today, many young Rinpoches are acquiring modern education and outlook and they are able to create much more impact on the society than perhaps the monks in the past were able to do. The recent holding of the mega event “*Naropa 2016*” by the Hemis monastery signified the emergence of monks and nuns. The process, it seems, is challenging to the newly emerged and established political leaders or politicians of Leh-Ladakh. Political leader or Chief Executive Councillor (CEC) skipping inaugural occasion of Naropa festival particularly could be designed to undermine or not to give importance to monasteries or head lamas. As a result, after the end of Naropa event, Hemis monks protested against the CEC for not receiving Gyalwang Drukpa Rinpoche properly. Many political leaders hitherto against each other for power came along with the LBA on a single platform by organising a press conference to condemn the protest by Hemis Monastery monks against the CEC declaring that attack on CEC is attack on hard-earned LAHDC or democracy in Ladakh. This stand off between the monks of Hemis Monastery and CEC is one of the manifestations of emerging power struggle.

Insecurity is emerging among the incumbent political leaders because of increasing popularity of monasteries and new breed of emergent Ladakhi head lamas. For instance, Thuksey Rinpoche born in Changthang, is increasingly getting popular among the public who is capable of taking reign of LBA or even can contest for elections in future. The popularity of upcoming and dynamic young Thuksey Rinpoche, who is able to capture the popular imagination of the people as he is qualified spiritually, intellectually and economically with his support base coming from Ladakh's richest Hemis Monastery. Surely, there may be another force working behind to project Thuksey Rinpoche as the future leader of Ladakh. Therefore, these shrewd secular political actors and the LBA might have seen the opportunity to exploit the Hemis-CEC rift by showing solidarity with the CEC albeit in the name of saving LAHDC to discredit the upcoming Monk-leader and his monastery. The point is that with increasing trend of emergence of young head lamas and monasteries, leaders of Ladakh are uniting to protect the temple of democracy and secularism. This is an interesting phase of religion and politics in Ladakh and there is a need to wait for the time to unfold things. Will these young lamas support the secular leaders during the election as star campaigner or will they themselves directly participate in politics remains to be seen in future particularly after the *Naropa Event 2016*?

## CONCLUSION

Religion as an instrument for political gain is against the principle of secularism. Ladakh having had no leadership among laymen compelled the head lamas, having people's acceptance, to join politics. However, they articulated the regional aspirations and interests more precisely than the present secular and educated leaders of Ladakh but at the same time created a sense of religious-minority sentiments among the non-Buddhist community of Ladakh. Today's Ladakh having different dynamic leaders need to focus on the regional issues not based on religion but on development of region or Ladakh as a whole. It is the need of the time for Ladakh to choose regional interests over religious sentiments that divides the region for individual gains. Therefore, for secularization of politics of Ladakh and maintaining independent domain between politics and religion, certain points and measures can be adopted by the respective stakeholders. Primarily, with separation of respective aspects, each domain has to play its own role to maintain social harmony and peaceful coexistence. The head lamas or monasteries need to focus on the religious teachings and maintain neutrality during election processes rather than influencing or campaigning for particular leaders. Buddhism is increasing its popularity across the globe for its philosophy and non-violence and followers are increasing particularly in western countries. Therefore, monasteries of Ladakh or head lamas would have greater role to contribute for maintenance of peace and harmony in the world rather than participating in politics for creating division and spreading hatred. Young head lamas are popular because of their dedication to the community and Ladakh. They are educated both in modern education and traditional Buddhist philosophy. The decision to join politics among them is their choice and right. However, instead of joining and influencing politics, they must engage themselves in religious teachings and other social work which would create secular character and environment for the society of Ladakh and also will help gain confidence among the non-Buddhist communities in Ladakh. Confidence and consensus are need of the hour to realize the demand for a separate political entity like UT for Ladakh. Therefore, in order to maintain social fabric and ethics in the society of Ladakh, organized body like LBA need to stop taking political position or becoming a platform for the established or the budding politicians. Instead, it has to focus more on social and religious development of Ladakh by helping the needy people and repairing the religious structures which have lost its forms and shapes. The active participation of LBA in politics not only divide Ladakh between Leh and Kargil but also create sectarianism by taking implicit or explicit stand on different religious sects within Leh. Therefore, each stakeholder performing its own duty hopefully would benefit the region of Ladakh in terms of development, prosperity and peaceful coexistence.

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# ON ‘SUSTAINABLE DEVELOPMENT’ AND ‘SUSTAINABILITY’: DIFFERENT EXPLANATIONS AND MEANINGS

Shuchita Sharmin\*

## ABSTRACT

*The aim of this article is to review the emergence of the concept of ‘sustainable development’. With the emergence and prominence of the term ‘development’ in the 1950s, it has been found to gain different focus at different points in time. The present paper explores these focuses and shows sequentially, the emergence of concept of ‘sustainable development’ focus in development discourse. In course of time, the term sustainable development has become a buzz word. The term ‘sustainable’ and ‘sustainable development’ started being found and used in different discipline with different meaning. The uses, understandings and meanings of ‘sustainability’ and ‘sustainable development’ also evolved within development discourse. In this context, this paper is an attempt to reviewing relevant noteworthy literature with a view to exploring different explanation and meaning of the concepts of ‘sustainable development’ and ‘sustainability’.*

**Keywords:** Agenda 21, Brundtland concept, Commission on Sustainable Development (CSD), Earth Summit, human rights, Millennium Development Goals (MDGs), Rio Declaration, Sloping Land Conversion Program (SLCP), Stockholm Conference, Sustainable Development Program, technical modernisation, Truman Doctrine.

## INTRODUCTION

In this review article the emergence and evolution of concept of ‘sustainable development’ in development discourse has been traced. The attempt is to show the uses, understandings and meanings of evolution of the concepts ‘sustainable development’ and ‘sustainability’ and thus to explore different explanations and meaning of the concepts.

## DEVELOPMENT

Development is,

a comprehensive economic, social, cultural and political process which aims at the constant

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improvement of the well being of the entire population and of all individuals on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom. (Office of the High Commissioner for Human Rights, 1986)<sup>1</sup>.

The notion of 'development' or it is better to say 'the notion of conscious development' or 'the idea that development can be fostered' is relatively new. After the World War II, on 20 January 1949, Harry S. Truman in his inaugural speech as the President of the United States introduced the concept of 'fair deal' for the entire world. Using the word 'underdeveloped', Truman, identified the problem of this huge portion of the world and indicated the solution to be modern scientific and technical knowledge of the developed. The Truman Doctrine initiated a new era in the understanding and management of world affairs, particularly those concerning the less economically accomplished countries of the world (Escobar, 1995). As a result, economic development and poverty reduction in the 'underdeveloped' parts of the world became an international agenda. The United Nations and other international organizations like, International Bank for Reconstruction and Development (IBRD; now World Bank), the International Monetary Fund, etc. were formed with the single focus of improving and reforming the economies rather than bringing political and social changes. By the end of the Second World War, perceptions and policies changed drastically. Only economic growth became a major concern of governments. Social and institutional improvement existed in theory and policy but at a very small scale. As decolonization (between 1945 and 1962) occurred, the international agenda of developing the underdeveloped world was extended to all the poorer nations of the world.

In 1960, W.W. Rostow published '*The Stages of Economic Growth: A Non-Communist Manifesto*'. In this ambitious overview of economic development, he put forward a scheme of five stages which all developing countries would pass through. Starting from the 'traditional' stage a society passes through 'preconditions for takeoff', economic 'take-off', 'drive to maturity' and finally reaches the 'age of high mass consumption'. Rostow and other modernization theorists saw development as the 'process of change towards those types of social, economic and political systems' created in Europe and the USA from the 17th century (Eisenstadt, 1966), that they believed to be essential to elevate living standards with more goods and services to an expanding population. Donors and the elites of most newly independent countries alike were committed to an almost missionary task, namely development through technical modernisation (Simon, 2000).

Escobar (1995) reported that in one of the most influential documents of the period. Prepared by a group of experts convened by the United Nations with the objective of designing concrete policies and measures 'for the economic development of underdeveloped countries', the report mentioned:

There is a sense in which rapid economic progress is impossible without painful adjustments. Ancient philosophies have to be scrapped; old social institutions have to disintegrate; bonds of caste, creed and race have to burst, and large numbers of persons who cannot keep up with progress have to have their expectations of a comfortable life frustrated. Very few communities are willing to pay the full price of economic progress. (United Nations, Department of Social and Economic Affairs, 1951) (p. 4).<sup>2</sup>

Escobar (1995) summarized saying that “the statement exemplified a growing will to transform drastically two-third of the world in the pursuit of the goal of material prosperity and economic progress” (*ibid.* p. 4).

Development conceived of as economic growth is a quantitative concept and basically means more of the same (Szirmai, 2005). But economic development is not economic growth alone. Economic development refers to growth accompanied by qualitative changes in the structure of production and employment, generally referred to as structural change (Kuznets, 1966). In the early 1950s, structuralist theories located the causes of underdevelopment in lingering colonial trade patterns and recommended import substitution as a solution. It is considered to be the era of engineers. The goal of development was to build infrastructure (roads, electricity, dams) in developing countries.<sup>3</sup> The great industrial resurgence, which gathered momentum in the 1950s, was State-directed, disciplined by targets, and frequently led by the public sector. The retreat from the first globalization, which began in 1914,<sup>4</sup> entered a new phase as capitalist and socialist economies and newly independent colonies embraced inward-looking growth policies (Findlay & O'Rourke, 2008).

With the emergence of the idea that ‘development can be fostered’ and belief in ‘development through technical modernisation’, ‘development’ was being used synonymously with economic growth. It is in the 1960s that this concept came under growing criticism. Many authors such as Dudley Seers, Gunnar Myrdal, Paul Streeten, Hollis Chenery, Mahbub ul Haq and institutions like International Labour Organization (ILO) pointed out that despite the impressive growth records in the post-WWII period in developing countries, much changes had not occurred in the living conditions of the masses of the poor (Szirmai, 2005; Chenery *et al.* 1974; ILO, 1976; Myrdal, 1971; Seers, 1979; Streeten, 1972; ul Haq, 1976). The conclusion drawn was that development involves more than economic growth and changes in economic structures (Szirmai, 2005). 1960s is the era of ‘Green Revolution’. The belief was, ‘technology improves farming’. The goal was to plant better crops to wipe out world hunger.<sup>5</sup>

In the late 1970's a focus on basic needs was advocated by Paul Streeten, Mahbub ul Haq, Amartya Sen and others. Their advocacy for education, nutrition, health, sanitation, and employment for the poor, reflected an acknowledgment that the benefits of development did not necessarily ‘trickle down’ to the deprived (Harris, 2000). Education was the main focus and actions were concentrated on promoting education.

With a shift in focus to ‘structural adjustment’, experience of 1980's also included liberalization of trade, eliminating government deficits and overvalued exchange rates, and dismantling inefficient parasitical organizations. International institutions imposed liberal development policies to the Third World countries during the post-WW II period. Between 1970s and 1980s, those proved to be wrong. Many countries were found to have chronic payment problem that indicated that those countries had fallen into economic crisis. The institutions, such as, the World Bank and the International Monetary Fund, which imposed liberal development policies earlier came up with the Structural Adjustment Policies (SAPs)<sup>6</sup> to address the then economic crisis in several African, Latin American, Caribbean and Asian countries between 1980s and 1990s. Through condition-based loan packages, SAPs were introduced “to push countries to the economic growth based on efficiency and stability”

(Abbasoglu, Aysan, & Gunes, 2007). On one hand, SAPs required poor countries to reduce spending on things like health, education and development, on the other hand, debt repayment and other economic policies were prioritized. In effect, the IMF and World Bank have demanded that poor nations lower the standard of living of their people.<sup>7</sup>

## EMERGENCE OF ‘SUSTAINABLE DEVELOPMENT’ AND ‘SUSTAINABILITY’

The significant focus in development consequently shifted to sustainable development. Concern about environment was not new. Environmentalists in the late 1960s and 1970s argued that exponential growth could not be sustained without seriously depleting the planet's resources and overloading its ability to deal with pollution and waste materials (Beder, 2005). For environmental problems industries, Western culture, economic growth and technology were blamed. Even at that time, the environmentalists questioned Western paradigms and strongly criticized inequitable distribution of wealth and resource use. Rachel Carson's '*Silent Spring*' (1962), Paul Ehrlich's '*The Population Bomb*' (1968), and Donella Meadows's '*The Limits to Growth*' (1972) showed the serious harmful effects of accelerating industrial growth and the chemical-dependent agriculture of the Green Revolution. By questioning the very possibility of progress, environmentalism then undercut the rationale and methods of development (Cullather, 2002).

Sustainable development has evolved from philosophical concerns about humankind's responsibility for nature (Passmore, 1974) into locally- and nationally-based environmental groups demanding more attention to the environment (Lowe & Goyder, 1983).

The United Nation's (UN's) first major international conference on international environmental issues 'The United Nations Conference on the Human Environment'<sup>8</sup> was held in Stockholm, Sweden, from June 5-16, 1972. It became a strong guiding force for the development of international environmental politics at that time (Baylis & Smith, 2005). The Stockholm Conference came up with the framework for future environmental cooperation and consequently the global and regional environmental monitoring networks (Baylis & Smith, 2005) were created. Not only was the awareness of environmental issues among public and governments increased (for example, many governments subsequently created Ministries for the Environment and/or national agencies for environmental monitoring and regulation), but also, later in 1972, a small secretariat 'United Nations Environment Programme' (UNEP) was established in the United Nations as a focal point for environmental action and coordination within the UN system.<sup>9</sup> Stockholm articulated the right of people to live "in an environment of a quality that permits a life of dignity and well-being."<sup>10</sup> Following the Stockholm Conference, about 50 governments worldwide were instrumental in adopting instruments or national constitutions that recognize the environment as a fundamental human right (Chenje, Mohamed-Katerere & Ncube, 1996). National legislation regarding the environment was also recognized by several different organizations. During 1971-75, 31 major national environmental laws were passed in the countries of the Organization for Economic Cooperation and Development (OECD), compared to just 4 during 1956-60, 10 during 1960-65 and 18 during 1966-70 (Long, 2000). Again, it is worth mentioning that, in 1972, before the Stockholm Conference, there were only about 10 ministries of environment; but by 1982, some 110 countries had such ministries or departments (Clarke & Timberlake, 1982).<sup>11</sup>



The idea of sustainable development was proposed in a 1981 report of the U.S. Council on Environmental Quality (CEQ), *'Global Futures: Time to Act'*. In this report, sustainable development was introduced as a key concept. Economic development, if it is to be successful over the long term, must proceed in a way that protects the natural resource base of developing countries (p. xxi) (Hecht, 1999). However, while reviewing literature, it has been found that definitions of sustainable development were given by authors even before 1981; to mention, Coomer (1979) wrote, "The sustainable society is one that lives within the self-perpetuating limits of its environment. That society... is not a 'no growth' society... It is rather, a society that recognizes the limits of growth... [and] looks for alternative ways of growing".

International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF) and UNEP in the World Conservation Strategy (IUCN-UNEP-WWF, 1980) defined sustainable development as the "maintenance of essential ecological processes and life support systems, the preservation of genetic diversity, and the sustainable utilization of species and ecosystems". Allen (1980) summarized the World Conservation Strategy and suggested that sustainable development is "development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life" (p. 23).

In 1983, the United Nations assigned a commission on environment and development under Norwegian Prime Minister Gro Harlem Brundtland to reconcile the objectives of environmental health and economic growth. The Brundtland Report, *'Our Common Future'* (United Nations, 1987), issued in April 1987, popularized the term 'sustainable development'. Brundtland defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, WCED, 1987). The Brundtland report further noted that this definition relies on two key concepts: one is that of 'needs', 'in particular the essential needs of the world are poor, to which overriding priority should be given'. The other is "the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (OECD, 2001).<sup>12</sup>

The apparently simple definition of sustainable development forwarded by the Commission very soon encompassed some very challenging notions, such as those of inter-generational equity, needs and limits (Elliott, 2006).

## **SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY: DIFFERENT USES, UNDERSTANDING AND MEANINGS**

The core issues and necessary conditions for sustainable development as identified by WCED (1987)<sup>13</sup> are food security, species and ecosystems, energy, industry and the urban challenge. Pursuit of sustainable development requires:

- A political system that secures effective citizens participation in decision-making;
- An economic system that provides for solutions for the tensions arising from disharmonious development;
- A production system that respects the obligation to preserve the ecological base for development;

- A technological system that fosters sustainable patterns of trade and finance;
- An international system that fosters sustainable patterns of trade and finance;
- An administrative system that is flexible and has the capacity for self-correction.

Subsequent elaborations and analyses have converted the simple Brundtland concept into a sophisticated system with three pillars – one each for the economic, environmental, and social aspects of sustainable development (Pearce, Markandya, & Barbier, 1989; World Bank, 1992, 2003)<sup>14</sup>.

In broad terms Tolba (1987 as cited in Pezzey, 1989, p. 68) identified the concept of sustainable development as encompassing:

- Help for the very poor because they are left with no option other than to destroy their environment;
- The idea of self reliant development, within natural resource constraints;
- The idea of cost-effective development using differing economic criteria to the traditional approach; that is to say development should not degrade environmental quality, nor should it reduce productivity in the long run;
- The great issues of health control, appropriate technologies, food self-reliance, clean water and shelter for all;
- The notion that people- centred intervention is needed; human beings, in other words, are the resources in the concept.

In 1992, leaders at the United Nations Conference on Environment and Development (UNCED) (unofficially known as the ‘Earth Summit’) (United Nations, 2007), built upon the framework of Brundtland Report to create agreements and conventions on critical issues, such as climate change, desertification and deforestation.<sup>15</sup> Agenda 21; the Rio Declaration on Environment and Development; the Statement of Principles for the Sustainable Management of Forests; United Nations Framework Convention on Climate Change and the Convention on Biological Diversity were adopted by more than 178 Governments at the Conference (UNCED) held in Rio de Janeiro, Brazil, 3 to 14 June 1992.<sup>16</sup>

The broad action strategy—Agenda 21— was drafted as the work plan for environment and development issues for the coming decades in 21<sup>st</sup> century. This was prepared as a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which there has been human impacts on the environment.<sup>17</sup>

Built on ideas from the Stockholm Declaration, with a vision to guide future sustainable development around the world, ‘The Rio Declaration on Environment and Development’ offered 27 principles. These principles defined the rights of people to development along with their responsibilities to protect the common environment. The Rio Declaration states that the only way to have long term economic progress is to link it with environmental protection. This will only happen if nations establish a new and equitable global partnership involving governments, their people and key sectors of societies. They must build international agreements

that protect the integrity of the global environmental and the developmental system.<sup>18</sup> Consequently, to ensure effective follow-up of UNCED, the Commission on Sustainable Development (CSD) was created in December 1992. CSD was thus responsible to monitor and report on implementation of the agreements at the local, national, regional and international levels.<sup>19</sup>

Throughout the 1990s, all the governments who adopted the Rio Declaration on Environment and Development worked for their promises, and regional and sectoral sustainability plans were developed. A wide variety of groups—ranging from businesses to municipal governments to international organizations such as the World Bank—adopted the sustainable development concept and gave it their own particular interpretations.<sup>20</sup> These interpretations have increased our understanding of sustainable development within many different contexts. Unfortunately, the Earth Summit +5 review<sup>21</sup>, as expressed in the Special Session of the General Assembly of the United Nations in 1997, “progress on implementing sustainable development plans has been slow”.<sup>22</sup> The identified key trends for the identified ‘uneven’ progress included increasing globalization, widening inequalities in income, and a continued deterioration of the global environment.<sup>23</sup> It was a disappointing progress review with single success stories outweighed by the overall failure of countries to give appropriate political weight to meaningful implementation (Brown, 1997).

In the OECD publication ‘*Sustainable Development: Critical Issues*’ (2001), with the identified international goals,<sup>24</sup> the consequences in action were criticised as follows:

International goals for emissions of greenhouse gases, protection of biodiversity, and preventing desertification have been established since the Rio Summit in 1992. A range of other conventions and protocols at the regional level set emission limits for a range of pollutants. Unfortunately the simple existence of these conventions and treaties does not mean that concrete actions leading to their achievement are underway, as lags in implementation have translated into a growing gap between goals and outcomes (p. 14).

The reality was such that, despite decades of ‘development’, poverty in the South continued to increase. Existing development approaches offered elegant models, but they were not working, not bringing the expected outcomes. Alternative paths<sup>25</sup> were urgently needed, with this understanding, at the beginning of the twenty-first century there was general agreement, at the global as well as national level, that poverty is unacceptable as part of the human condition (Naseem, 2002).<sup>26</sup> Thus, globally it has been recognized that the coexistence of pervasive poverty, with the affluence of a much smaller segment of the population, is ethically unacceptable, economically inefficient, and politically unsustainable. With this reality of inequality and the unacceptability of it, the eight Millennium Development Goals (MDGs) were agreed upon at the United Nations Millennium Summit in September 2000 by 190 countries in ten regions. It has been adopted as a framework for the development activities.

The next milestone on the way forward to ensure sustainable development was the World Summit on Sustainable Development (WSSD) (also named the Earth Summit 2002), that was held in Johannesburg, South Africa from 26 August to 4 September 2002. Nitin Desai, the Secretary-General of the World Summit on Sustainable Development<sup>27</sup>, in his introductory note ‘Johannesburg and Beyond: Making Sustainable Development a Global Reality’ (published in

‘Global Challenge, Global Opportunity: Trends in Sustainable Development’)<sup>28</sup> started with the following statement to clarify what the issue is all about:

“Since the Rio Earth Summit in 1992, sustainable development has emerged as a new paradigm of development, integrating economic growth, social development and environmental protection as interdependent and mutually supportive elements of long-term development. Sustainable development also emphasizes a participatory, multi-stakeholder approach to policy making and implementation, mobilizing public and private resources for development and making use of the knowledge, skills and energy of all social groups concerned with the future of the planet and its people”.

With the strengthened commitment to ‘full implementation’ of Agenda 21 and achievement of the Millennium Development Goals and other international agreements, the ‘Johannesburg Plan of Implementation’ was adopted at the Earth Summit. There, the full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were strongly reaffirmed.<sup>29</sup>

In reality, even the governments had been found to try hard to establish what they promised at the Earth Summit in 2002. The concept of sustainable development has established itself successfully as a central guiding principle for many different political institutions at all levels of public and corporate decision making. Nevertheless, different studies confirmed that sustainable development’s meaningful translation into concrete action proves to be a much more difficult challenge (Lafferty, 2004; Lafferty & Meadowcraft, 2000; OECD, 2002; Volkery *et al.* 2006).

The definition of sustainable development, as was given in the Brundtland Report, ‘*Our Common Future*’, became the only acceptable ‘true’ definition of sustainable development (Jepson, 2004) and still continues to be the most preferred definition.

Unfortunately, from the very inception, the concept ‘sustainable development’, with its vague descriptive definition, was left open to different possible interpretations and different possible meanings. Consequently, interpretations of the concept exploded with different users proposing different study-specific or context specific definitions. Again, numerous treatments have been highly critical of ‘*Our Common Future*’; the report has been seen as both ambiguous and contradictory and incapable of specifying the mechanisms and changes necessary to realize sustainable development (Langhelle, 1999). Langhelle (1999) pointed to the limitations of the definition saying,

“... the relationship between sustainable development and economic growth had been over-emphasized, and that other vital aspects of the normative framework were neglected. Social justice (both within and between generations), humanistic solidarity, a concern for the world’s poor, and respect for the ecological limits to global development, constitute other aspects of sustainable development; aspects which are indeed relevant for the growing disparity between North and South”. (p. 132)

Literature shows that considerable attention had been devoted to the idea of sustainable development itself and even to the broader conceptual framework of the idea. But, the effort

of Brundtland Commission, to integrate environmental policies and development strategies in order to create a foundation for the intergenerational concept had been left out neglected as found in those literatures (Langhelle, 1999). Volkery *et al.* 2006 in their study on 19 countries found that regarding the inter-generational principle of sustainable development, setting long-term objectives contributes to a better inter-generational objective. But only five of the countries (Sweden, Denmark, Germany, the Philippines, and Mexico) considered a strategy outlook that was explicitly intergenerational, that is, spanning upwards of 25–30 years into the future.

The issues of weak and strong sustainability also came up to explain the ways of considering the needs to ensure that future generations can supply their needs. As put in Beder's (2000) words:

There are two different ways of looking at the need to ensure that future generations can supply their needs. One is to view the environment in terms of the natural resources or natural capital that is available for wealth creation, and to say that future generations should have the same ability to create wealth as we have. Therefore, future generations will be adequately compensated for any loss of environmental amenity by having alternative sources of wealth creation. This is referred to as 'weak sustainability'. The other way is to view the environment as offering more than just economic potential that cannot be replaced by human-made wealth and to argue that future generations should not inherit a degraded environment, no matter how many extra sources of wealth are available to them. This is referred to as 'strong sustainability' (p. 230).

In the discussion of intergenerational perspective of sustainable development, along with debate of "whether the weak sustainability or the strong sustainability is acceptable", the issues of intergenerational and intra-generational<sup>30</sup> had also been being raised by some (Benton 1999, p. 202; Paul-Marie Boulanger<sup>31</sup>; Brian J Preston<sup>32</sup>) and finally, the conclusion drawn was the meaning literally comes as "sustainable development refers to maintaining development over time" (Elliott, 2006).

In reality, in the countries in the south, the concept of intra-generational equity emerged. At this point, it is worth to note what Paul-Marie Boulanger<sup>33</sup> mentioned:

"It is obviously impossible to compensate *ex ante* future generations for facing possible unfavourable circumstances. All that can be done here is trying to make the case that the circumstances they will face will be as favourable as possible, within the limits of what is required by intra-generational equity".

The above discussion leads to a comprehensive understanding about the emergence of sustainable development and its evolution. It also ascertains that sustainable development is a complex concept that leads to many different interpretations in relation to many different contexts. Although, environmental component, along with the economic and social received recognitions in this concept concern issues such as, 'pillars', 'core issues', 'essential requirements', 'needs', 'limitations', 'intergenerational sustainability', 'intra-generational sustainability', 'strong sustainability', 'weak sustainability', etc. debates persist along with the controversies regarding interpretations of sustainable development. The issue of intra-



generational equity has gotten recognition. Before considering intergenerational equity and strong and weak sustainability, it is worth mentioning what Beder (2000) stated,

“The reason that intra-generational equity is a key principle of sustainable development is that inequities are a cause of environmental degradation. Poverty deprives people of the choice about whether or not to be environmentally sound in their activities”. (p. 233)

However, till now, the consideration of intra-generational perspective of sustainable development is least considered in the context of sustainable development in the present day.

Moreover, with the popularization of the concept of sustainable development, the term ‘sustainable’ became a buzz word not only in development sector but also in every possible sector. They started to use the term with its literal meaning, and sustainable development was thus referred to what Elliott (2006) mentioned, “Maintaining development over time”. In course of time the term ‘sustainable development’ crept into use in many disciplines and in several sectors.

As asserted by Spreng and Wils (2000)<sup>34</sup> Sustainable development is a concept with many attractions. One characteristic of the concept is its openness. However, this also means that the concept is sometimes vaguely used and badly understood.

For all the ‘Sustainable Development Program’ as identified by Grosjean and Kontoleon (2009), the duration of the financial incentives or subsidies provided is finite. This is because the aim is to induce a structural economic change at the local level such that this ‘win-win’ objective of poverty alleviation and environmental improvement becomes self-sustainable. These programmes received huge funding that led to their proliferation. Efforts have also been made to investigate the extent to which these programmes have been meeting their dual objective of addressing environmental externalities and economic development, Grosjean and Kontoleon (2009) reported. The sustainability of these sustainable development programmes has been questioned through studying these programmes (Louviere, Hensher, & Swait, 2000; Mercer & Snook, 2004; Grosjean & Kontoleon, 2009).

The Sloping Land Conversion Program (SLCP) in China is the largest sustainable development programs that simultaneously attempts to address rural poverty and externalities from deforestation. Analyses by Bennett *et al.* (2004), Uchida *et al.* (2007), Uchida, Xu, and Rozelle (2005), and Xu and Cao (2001) suggests that the SLCP impact on participating HH income levels and on shifts to non-crop related income generating activities (such as off-farm labour or livestock activities) is not sufficient to make a substantial and long lasting change to pre-program production decisions. Grosjean and Kontoleon (2009) pointed to the various program implementation issues that have been observed. For example, the often involuntary nature of the program, the poor quality and frequent irregularity of the compensation payments, the inadequate training and support to local farmers in replanting and maintaining trees, and the inappropriateness of some of the plots targeted for inclusion in the program have undermined the long-term viability of the program (Xu & Cao, 2001).

The above examples address the issue of sustainability in terms of evaluation. The OECD

Development Assistance Committee glossary (Organisation for Economic Co-operation and Development - Development Assistance Committee, OECD-DAC, 1991),<sup>35</sup> in this regard, states, “Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Projects need to be environmentally as well as financially sustainable.”

For the World Bank ‘Sustainable development recognizes that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for people today and for future generations.’<sup>36</sup>

Operations Evaluation Department (OED) defines sustainability as “The resilience to risk of net benefits flows over time”, elaborating the definition with the following questions (White, 2005):

“At the time of evaluation, what is the resilience to risks of future net benefits flows? How sensitive is the project to changes in the operating environment? Will the project continue to produce net benefits, as long as intended, or even longer? How well will the project weather shocks and changing circumstances?” (p. 13)

Canadian International Development Agency (CIDA) (2002) in its publication, ‘*Assessing Sustainability*’, stated, “Much remains to be done in terms of [sustainability’s] evaluation as an objective.”

The Sustainable Development Goals (SDGs) in this context draw our attention. For IMF ‘The SDGs are universal and broader in scope than the MDGs, reflecting the view that development needs to be economically, socially, and environmentally sustainable’.<sup>37</sup> This explanation again provides a wide meaning of sustainable development. As well, the question can be raised as to how sustainable the sustainable development goals will be and what this sustainability will mean?

## CONCLUSION

With the above discussion on sustainable development, the concern about ‘sustainability’ is identified as an inherently dynamic, indefinite and contested concept. ‘Sustainable’, the buzz word dominates not only the development sector but also every possible sectors with the part of its literal meaning – ‘maintaining development over time’ (Elliott, 2006), as I have mentioned earlier. The use of the term sustainability in many other disciplines and sectors failed to capture the ecological aspects of sustainability. Hence, it failed to capture the full sense of ‘sustainable’, as was eulogized in the World Commission’s keynote phrase ‘sustainable development’. In most cases, their consideration is found to be merely the ‘long-term satisfaction of basic human needs’.

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4. There are scattered evidences on global integration as a result of advances in ship building and the growth of trade accumulating from the 15th century onward (on 'archaic' globalization, see Bayly, 2002). One scholar maintains that the Roman Empire was a major globalizing force because it expanded markets; imposed peace; and integrated culture, technologies, and ideas (Hitchner, 2008).
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# IMPACT OF HYDRO POWER PROJECTS ON WATER RESOURCES IN UTTARAKHAND

Gayettri Dixit\*

## ABSTRACT

*The Himalaya is the youngest mountain and still in making. Therefore its fragility, sensitivity and seismic behaviour are but natural. Himalayan ecological system is disturbed because of functional and ongoing HEP in Uttarakhand and number of spring water resources dryup due to tunnelling and blasting in unique ecological features. Hence the immediate stoppage of ongoing big HEP is required and more of Micro-hydel project should be encouraged. Water is vital requirement for our existence. Rivers are dying due to human induced causes. Judicious use of riverine water and water harvesting is the only way to make it alive. The paper is an attempt to delineate the impact of large hydropower projects in the state of Uttarakhand nested in the middle Himalayas.*

**Keywords:** Biodiversity, dams, Energy, Glacier, Himalaya, Hydropower projects, Water.

## INTRODUCTION

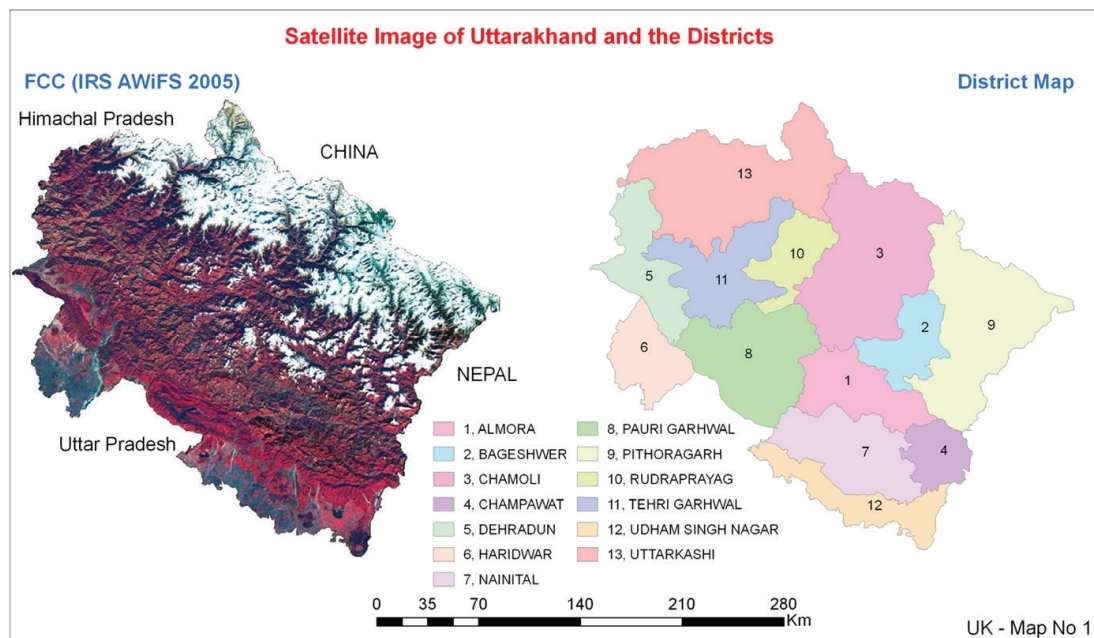
Uttarakhand is India's newest Himalayan state. It has geographical areas of 53,483 sq km. Uttarakhand which constitutes 1.63 percent of the country's total area is predominantly mountainous region (88% area). Forests comprise 64.54% of its geographical area. Northern part of the state is covered by the high Himalayan peaks and glaciers while the southern part with lower foothills is densely forested and drained by the mighty Ganga and its tributaries. Its climate, vegetation and geological features vary greatly with elevation, exhibiting glacier ice and barren rock in the north to subtropical forests at the lowest elevation.

Uttarakhand is a part of the Western Himalaya physiographic division. The Great Himalaya region is dominated by snow-clad ranges. It remains largely remote, sparsely populated and unspoiled. It is home to large, very high quality landscapes like the sub-alpine and temperate forests along with alpine meadows of Har Ki-Doon, Gangotri National Park, Kedarnath Musk Deer Sanctuary, Nanda Devi Biosphere Reserve, Valley of Flowers and the pristine Pindari,

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Gori Ganga, and Darma valleys. The Middle Himalaya region lies between the Main Central Thrust (MCT) and the Main Boundary Fault (MBF) with ridge heights ranging from 2,000 m to 3,000 m. It provides scenic vistas of the snow-covered Himalaya, terraced fields, oak and rhododendron forests and broad river valleys. (See Figure 1.1).



**Figure 1:** Satellite Image of Uttarakhand & District Map.

Source: <http://www.india-wris.nrsc.gov.in/Publications/reports/Uttarakhand.pdf>

## WATER

Uttarakhand is a land of snow and water and part of larger Himalayan 'water tower' of Asia (Thayyen *et al.* 2007). The state is associated with monsoon, glaciers and the forests and without them one cannot understand the Himalayan hydrology. The high Himalayan wall, monsoon cycle and many components of Himalayan natural system jointly make the climate of South Asia. The destruction of the Himalayan eco-system therefore directly impacts water resources. The behaviour of a Himalayan river is associated with glaciers, forests and geomorphology of the catchment areas which captures the bountiful rainfall averaging about 1550 mm. Between the Tons river along its western boundary and the Kali river at the eastern end, thousands of rivers and streams nourish Uttarakhand. It is also known as the land of a thousand Gangas. While rivers are important for agriculture and hydropower generation, thousands of springs sustain lives and livelihoods on the mountain slopes. In the Northern Inner Himalaya zone, the rivers are fed by glaciers and are fast flowing. Over nine hundred glaciers feed major rivers (like the Yamuna, Ganga and Kali, and their tributaries like the Tons, Bhagirathi, Bhilaganga, Mandakini, Alakananda, Nandakini, Pindar, Dhauliganga (East) and the Goriganga among others). On the others side lies the middle Himalayas - the most

populated belt which is nourished by innumerable spring-fed rivers. The rivers originating further south in the Shivaliks are essentially monsoon torrents, with very little water flowing for the rest of the year. These Himalayan rivers provide pristine water, fertile silt and are home to diverse kind of life forms because of MCT (Main Central Thrust) and other associated thrusts, forces impacted river behaviour and have molded these into a kind of living entity.

All these character of Himalayan Rivers have also become a rich source of hydro-power. Government and private sector have proposed number of hydel power project in Uttarakhand. As a result, the Himalayan region and particularly Uttarakhand, went through deforestation, mining, road construction, tunnelling, use of explosives in HEP construction etc. which increased the volume of loose mass (silt, muck, debris, boulders, and tree trunks/roots) in and around rivers, changing their behavior drastically. Loss of the soil and vegetation, drying up and shifting of natural springs and decline in the agricultural production characterize these areas today. One can take the cases of Someshwar and Baitalghat areas in Kosi valley (districts of Almora and Nainital) and many places in Kamal river (Uttarkashi), Aglad (Dehradun), Balganga (Tehri), Nayar (Pauri), Saryu (Bageswar), Binu, Nayar, Ramganga East and Gori (both Pithoragarh) etc.

**Energy Resources of India<sup>1</sup>** : Industrialization is the prime element of economic development for any country. That is why for rapid economic development, India needs huge and continuous energy for daily use of people as well as industries. While on the other hand, non-availability of energy can increase production costs, fuel inflation and lead to economic recession. The source-wise power generation pattern in India is shown in Table 1 below.

**Table 1: Source-wise power generation in India-Installed capacity (28.02.2017)**

Fuel	MW1	%
<b>Total Thermal</b>	215,214	68.23
<b>Hydropower</b>	44,413	14.08
<b>Nuclear</b>	5,780	1.83
<b>Renewable sources</b>	50,018	15.85
<b>Total</b>	315426	100

**Source:** [http://www.cea.nic.in/reports/monthly/installedcapacity/2017/installed\\_capacity-02.pdf](http://www.cea.nic.in/reports/monthly/installedcapacity/2017/installed_capacity-02.pdf)

**Notes:** (1) Rounded off to the nearest integer. (2) Renewable Energy Sources (RES) include small hydro, biogas, biomass, urban & industrial waste power and wind energy

Increasing the demand for commercial energy is now being met by imports, largely due to oil and gas. India is now the fourth largest consumer of oil in the world. The production and use of fossil fuels poses severe risks for India's environment, energy security and ability to mitigate climate change impacts. Therefore there is a push away from its dependence on fossil fuels. That's why India's efforts specially on developing hydropower and nuclear power.



## HYDROPOWER DEVELOPMENT IN INDIA

Hydropower is the most clean and an indigenous renewable energy resource. India's ultimate hydropower potential has been assessed at an installed capacity of 148,700 MW from 25 MW or larger plants (MoP, 2008:1). A total of 845 such hydropower projects have been identified all over the country which would be capable of annually delivering 600 billion units (kwh) of power. Another 98,000 MW installed potential has been identified from pumped storage sites and 6782 MW installed capacity in small, mini and micro hydel stations (all less than 25 MW). The growth in India's installed hydro capacity from the 1<sup>st</sup> Five Year Plan to the start of the 12th Five Year Plan is shown in Fig. 2. Almost 70 per cent of India's estimated hydropower potential is in the Himalayan states. With the shift from state-led development to market-led development in 1991-92 and the Government of India's decision to fast track power projects the role of the private sector has become significant in these states, many of which are cash strapped.

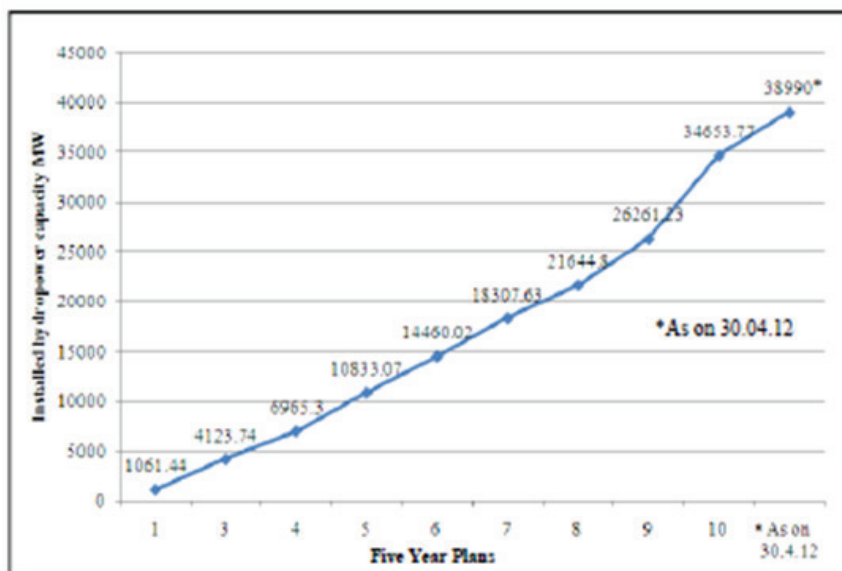


Figure 2: Plan-wise growth in installed hydropower capacity

## HYDROPOWER PROJECTS DEVELOPMENT IN UTTARAKHAND

After Arunachal Pradesh, Uttarakhand has the second largest hydropower potential among the Himalayan states.<sup>2</sup> Uttarakhand hydropower development programme is set within the context of the national power sector plans, policies and programmes. Availability of power is an important driver of economic growth. Uttarakhand has also been termed as the *Urja Pradesh* because of availability of Water. Uttarakhand Jal Vidhyut Nigam Limited (UJVNL), a state government owned hydropower mentions that Uttarakhand state has identified 450 potential HEPs. Uttarakhand's potential installed capacity and present/under construction installed capacity are shown in Table 2 and 3. They are categorized by size and their construction status.

Table 2 shows that 92 projects have been commissioned so far and 38 are said to be under construction. Detailed Project Reports (DPRs) have been prepared for another 38 projects and they are awaiting clearances (Table 3). The remaining 282 are still on the drawing board, undergoing surveys and investigation. A large fraction of the 450 HEPs are diversion projects that divert the river water through tunnels into power houses, while a small number (12) are storage projects.

**Table 2: Installed Capacities of Commissioned & Under Construction HEPs in Uttarakhand**

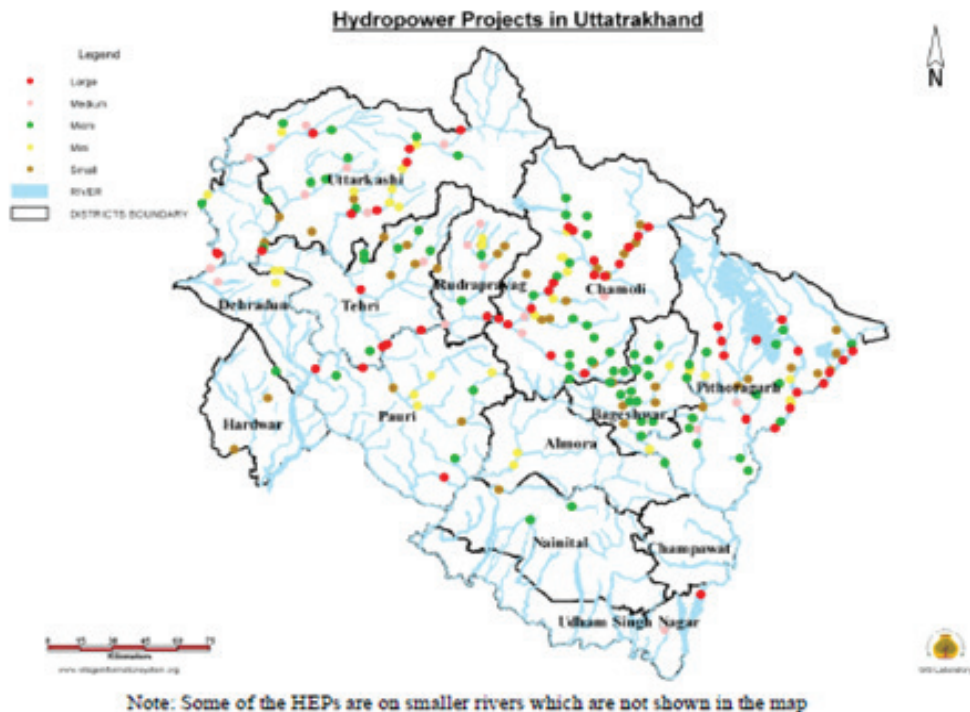
Project Status	Micro-Mini			Small	Medium	Large	Total
	$\leq 1\text{MW}$	$>1\text{MW} \leq 2$	$>2\text{MW} < 5$	$\geq 5\text{MW} < 25$	$\geq 25\text{MW} < 100$	$\geq 100\text{MW}$	
<b>Commissioned</b>	11.96 (54)	7.15 (5)	31.3 (9)	121.6 (9)	246.15 (5)	3206 (10)	3624.16 (92)
<b>Under Construction</b>	2.78 (15)	3.5 (2)	20.4 (5)	76.5 (8)	175 (2)	3014 (6)	3292.18 (38)
<b>Total</b>	14.74 (69)	10.65 (7)	51.7 (14)	198.1 (17)	421.15 (7)	6220 (16)	6916.34 (130)

*Source:* UJVNL, December 2013. Figures in ( ) give the number of projects

**Table 3: Potential Installed Capacities (MW)**

Project Status	Micro-Mini			Small	Medium	Large	Total MW
	$\leq 1\text{MW}$	$>1\text{MW} \leq 2$	$>2\text{MW} < 5$	$\geq 5\text{MW} < 25$	$\geq 25\text{MW} < 100$	$\geq 100\text{MW}$	
<b>Awaiting Clearance</b>	1 (1)	1.9 (1)	7 (2)	303.8 (22)	196 (3)	2808 (9)	<b>3317.70 (38)</b>
<b>S &amp; I Stage</b>	21.28 (58)	32.85 (18)	101.25 (28)	1086.25 (84)	2233.8 (63)	13330 (31)	<b>16805.43 (282)</b>
<b>Total</b>	<b>37.02 (59)</b>	<b>45.4 (19)</b>	<b>159.95 (30)</b>	<b>1588.15 (106)</b>	<b>2850.95 (66)</b>	<b>22358 (40)</b>	<b>27039.47 (320)</b>

*Source:* UJVNL, December 2013: S & I= Survey and Investigation

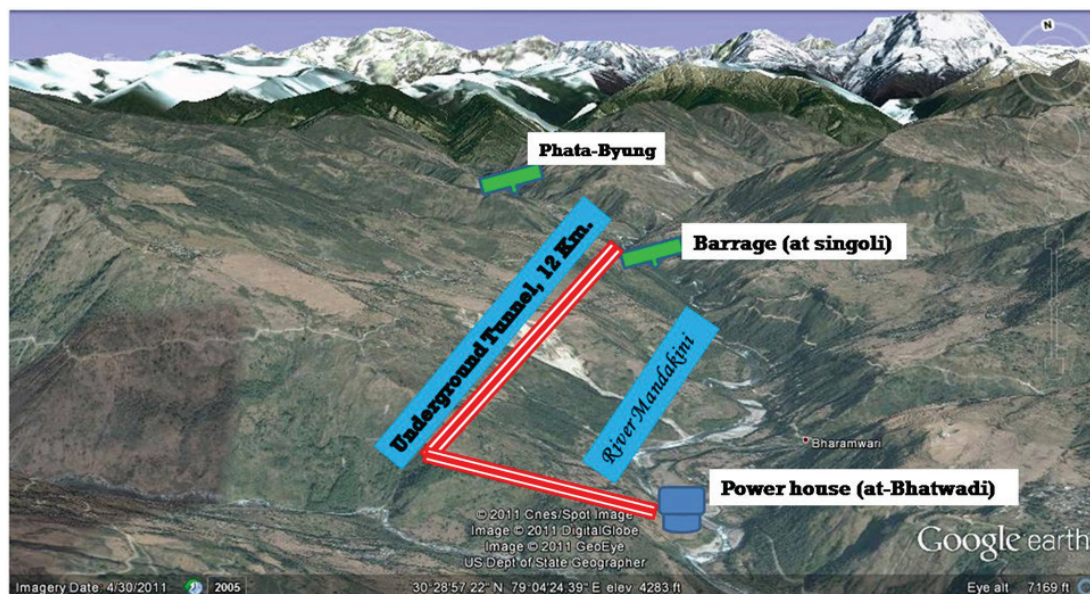


**Figure 3: Locations of some HEPs in the state**

Tables 2 and 3 also show that just 56 large dams ( $> 100$  MW) will account for about 83 percent of the ultimate installed potential as estimated by UJVNL. Large (56) and medium (73) projects will account for over 93 percent of the estimated ultimate installed capacity. Finally 321 small ( $5 < \text{MW} < 25$ ), mini and micro projects will provide just 7 percent of the total installed capacity.

The ultimate installed potential of 27,039 MW assessed by UJVNL is almost 50 percent higher than the hitherto authoritative figure of 18175 MW determined by the 1987 reassessment survey of the Central Electricity Authority (CEA). The UJVNL figure includes the 6,630 MW Pancheshwar dam whose construction requires joint action by the Nepal government. That appears unlikely in the foreseeable future. It led to the cancellation of several dams within the ESZ (Eco-sensitive Zone) with a total installed capacity of about 2040 MW. Hence a more realistic estimate of the ultimate state hydro potential would be about 18,379 MW. Tables show that Uttarakhand has been able to commission about 13.4 percent of its potential installed capacity by 2013; another 12.2 percent is under construction and 12.3 percent are awaiting clearances. Once all these 168 projects are completed the installed potential created will be about 10234 MW. The existing and under construction (older projects) are mainly state sector projects; only 10 out of the 22 awaiting clearance and 80 out of 282 in the survey and investigation stage, however, are state sector projects. Hence the role of the private sector in developing Uttarakhand's hydropower is likely to grow.

There are many projects commissioned by the state government and central Government as well. Some projects are functional and some are under construction. These hydel power projects are called run off river project but actually these are not the run of river projects. For example Alaknanda (Vishnu Prayag Project and Maneri Bhali-1 and 2 projects) are not mere run off projects. It becomes clear after the river bed completely dries up. Moreover geomorphology of Uttarakhand Himalaya requires almost all the projects to be based on tunnel, making barrage and creating artificial lake/barrage. Wheresoever these project are functional, a stretch of 15 km of river completely dry up as they release the water into tunnel and after that the water emerges where the next hydro power project barrage is constructed. Thus, there are cascade of Hydropower Plants in a single project.



Source: [www.gangaahvaan.org](http://www.gangaahvaan.org)

**Figure 4: Typology of Run of River Scheme in Himalayan river valleys**

## IMPACT OF HYDROPOWER PROJECTS

Faced with growing complaints against blasting, a few developers have also begun to use tunnel boring machines (TBMs) in the last few years. Till now, practical difficulties in using TBMs in the Himalayan region have deterred HEP developers from using them (Macfeat and Smith, 2008). But in diverse Himalayan locations in Jammu & Kashmir, Himachal Pradesh, Sikkim and Assam, experts have reported a major tunnelling accident in the vicinity of Joshimath where a TBM was employed (Rautela, and Bisht, 2010:1271). It has resulted in a significant loss of water resource and the machine has been stuck inside the unfinished tunnel. Here the head race tunnel of the Tapovan-Vishnugad HEP traverses through the geologically fragile area below Joshimath. Rautela and Bisht writes, "A tunnel boring machine was employed for excavating the head race tunnel. On 24<sup>th</sup> Dec'2009, it punctured water bearing



strata some 3km inward the left bank of Alaknanda near Shelong village. The site was more than a kilometer below the surface, somewhere below Auli, according to project authorities. The water discharge was reportedly between 700-800 litres/sec. The aquifer discharge was about 60-70 million litres daily, enough to sustain 2-3 million people. Even after a month, the aquifer had not dried out.”

**Loss of water sources:** Based on the field visits, the most common sighting of the environmental degradation reported about, due to the ongoing & existing hydropower projects is the loss of water sources. In all the places wherever the dam construction has happened or is in process, this has been the most immediate & significant finding.

Dried water sources have been found around Alaknanda and Vishnuprayag Hydropower project. In Dhanari Patti - collection of 13 villages affected by the Maneri - Bhali (II) HEP (340MW) in Uttarkashi, reports of loss of perennial spring water sources have been reported. A huge stream called Kairi Gad has completely dried up after the construction of Maneri Bhali 2. In the monsoons, the stream revives to support the paddy farming for a few months but in certain years, when the rains aren't sufficient, the crop suffers tremendously. Bukki, Hurri, Pala, Salang & Siror - villages have been affected by the partial construction of Loharinag-Pala & Pala- Maneri Hydropower projects. People have reported loss of water sources. Sudden loss of water source in Phata Bazaar that served 7 villages in the vicinity of under-construction Phata - Byung HEP, have been reported. Dhutu Bhilanga HEP has been opposed by the locals of Devlinga & Veena village since uncontrolled blasting in the area led to severe loss of drinking water sources for the villages. The locals complained that there was a massive expulsion of natural water sources into the tunnels being made for the HEP. Tipri village located 500mtrs above the Tehri reservoir is a typical example of loss of water sources with the construction of dams. This village had many natural spring water sources in the past but all of them have dried ever since the reservoir was built.

**Impact on River System:** Rain and snow feed thousands of streams and rivers that course through Uttarakhand. Twelve important glacier-fed rivers span the entire state (west to east): the Tons, Yamuna, Bhagirathi, Bhilangana, Mandakini, Alaknanda, Dhauliganga (W), Nandakini, Pindar, Ramganga (E), Gori Ganga, Dhauliganga (E) and the Mahakali. Hundreds of smaller glaciers and springs fed streams meet these rivers along their length. Natural functions inherent to rivers depend on sustaining the integrity (continuity and spread) and variability of their natural flows. They include transporting water and sediments from their catchments to the sea; shaping the landscape and their own channels; supporting aquatic and terrestrial biota; water, nutrients and energy cycling and digesting pollutants or self-cleansing. Uttarakhand's rivers support an estimated 125 fish species (WII, 2012: 3).

Glacier and snow melts provide good flows in the summer. This makes hydro based Uttarakhand generally power surplus in summer when power generation from rainfed rivers is minimal elsewhere. Power in excess of the state's own needs is traded or banked with other states so that Uttarakhand can buy power in the winter, when its own hydro generation is reduced due to the absence of glacier and snow melts. But hydropower projects alter the natural flow patterns of rivers. Most of Uttarakhand's HEPs are diversion projects which divert water upstream of a dam into a tunnel and drop it several kilometers downstream in order to

obtain a large head. The stretch of the river between the dam and the powerhouse, often 10 to 20 km, goes dry during the non-monsoon months when only a nominal flow is allowed to flow into the river or is added by small streams in between (See Fig. 5).



**Figure 5: River Alaknanda downstream Vishnuprayag dam in Chamoli district**

Series of dams are proposed for the major rivers of Uttarakhand. They will have a dam every 20 to 25 km of their length, in some cases after even shorter stretches. They will be converted into a series of ponds (reservoirs behind the dams) connected by pipes (tunnels). Large fragments of these rivers could be left with minimal flow as almost all the river water is extracted for producing hydroelectricity,<sup>3</sup> as per current practice. This can lead to synergistic cumulative impacts, especially when the zone of influence of one dam overlaps with that of the neighbouring dams. Storage projects generally reduce the annual discharge, the seasonal flow variability and the daily flow pattern downstream of dams. The magnitude of change and impacts depends on the design of the project and its operation.

A river's ecosystem develops in response to its water flow pattern. Once a river bed dries up or remains dry for significant periods, its ecosystem changes. Species that need to remain under water all the time decrease and are replaced by hardier ones. This change in the species populations and diversity can affect the entire aquatic food chain. Riverine vegetation, including that of the flood plains, changes as water and nutrients are withdrawn. Dams hold back sediments, gravels, cobbles and other debris leading to greater erosion of river beds and banks downstream and the loss of spawning or feeding habitats for various aquatic organisms including fish. Dams and barrages also block the movement of migratory fish species. It is speculated that when large fractions of river lengths go dry due to multiple projects on them, changes in the micro climate may occur. The temperature in the river valley may increase. The accompanying reduction in moisture can diminish the valley's biodiversity and productivity. In the long run it may also speed up the melting of nearby glaciers.



River managers in many parts of the world value rivers as freshwater ecosystems. Rivers require varying amounts of water during the year to sustain their ecosystem and anthropocentric functions. Hence in recent decades river managers have begun to implement the concept of environmental flows (EF), defined as an ‘acceptable flow regime designed to maintain a river in a predetermined state’, i.e., a pattern of flows that mimics the natural flow variations (Smakhtin & Anputhas, 2006:6). The critical aspect is to maintain the variability of the flow and not just the amount of flow. In 2000, the Report of the World Commission on Dams noted that 29 countries were releasing environmental flows to meet predetermined ecosystemic objectives (WCD, 2000: 81). In a country like India the environmental flows released downstream from dams must be adequate to meet social, cultural, livelihoods and other anthropocentric needs.



**Figure 6: River Bhagirathi downstream of the Maneri Bhali I dam**



**Figure 7: River Bhagirathi downstream of the Maneri Bhali II barrage**

The impacts of HEPs on Indian rivers and in particular their flow patterns are rare. The few that have been conducted by reputed investigators highlight four critical impacts as explained below.

**(i) Dry river beds:** A perusal of the EIA reports of several existing HEPs in Uttarakhand reveals that scientific assessments of EF requirements have not been done. Provisions are only made for minimum downstream releases. Many reports simply state that while several kilometers of the river will go dry, there will be no significant impact, except on benthic invertebrates and fish. Dry stretches are therefore routinely visible below the Vishnuprayag HEP (Fig. 5), the Maneri Bhali-I dam (Fig. 6), the Maneri Bhali-II barrage (Fig. 7), and Ichari dam among others, particularly in the non-monsoon months. A water quality study of the Bhagirathi River conducted by National Environmental Engineering Institute (NEERI), Nagpur noted that “a stretch of the river is completely dried in between Maneri and Uttarkashi due to diversion of water, required for Maneri Bhali project” (NEERI, 2011). A CAG study team also found dry river beds downstream of the sites it visited. In several locations it noted that the local people were deprived of drinking water and irrigation resources (CAG, 2010: 28-29). A review of the multipurpose Ramganga project commissioned by the Central Water Commission (CWC) reported that 10 per cent of the lean season flows (av. 5 cumecs) were supposed to be released for ecological conservation. But such releases are not made says the review (AFC, 2012). Consequently pollution levels due to urban areas and industries on the banks of the Ramganga are very high.

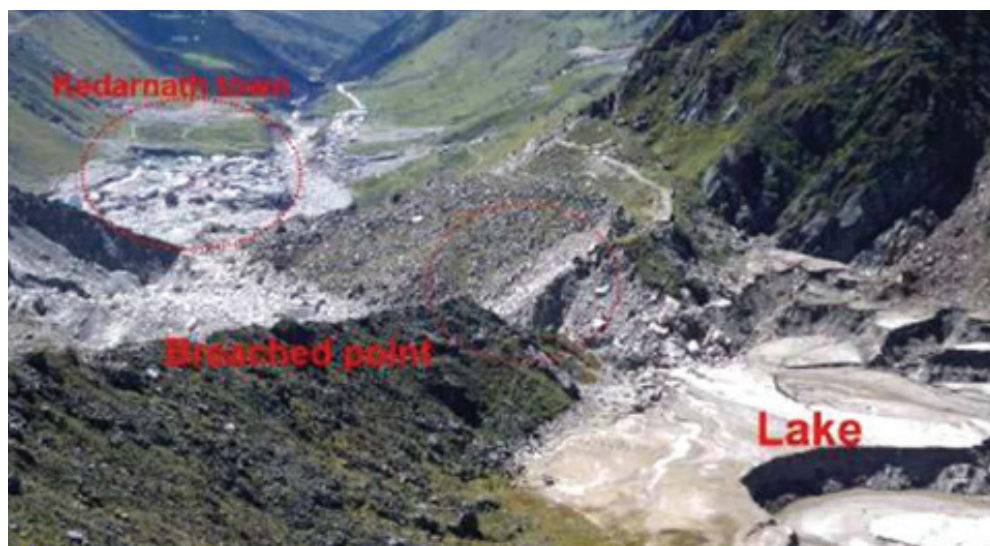
**(ii) Fragmentation of river length:** When a number of dams are built in a series on a river, each dam fragments the river due to minimal flows between the dam and the power house. In these stretches the rivers lose their continuity and spread. As a result they are unable to perform their natural functions. The loss of natural flows also affects anthropocentric values of rivers, i.e., social, economic, cultural, aesthetic and recreational values. No EIA report discusses the cumulative impact of minimal flows due to multiple projects in its valley. The ratio of the river length diverted to its total length is a good indicator of the cumulative impact of multiple dams. The affected river length was first determined by AHEC. IMG recommended that some of the rivers be maintained in a pristine state which would mean the cancellation of a few projects and hence changes in the river length affected. The HEPs lead to discontinuation of free flow in large lengths of the river because the river either turns into a reservoir or flow is diverted through channels.

## IMPACT OF HYDROPOWER PROJECTS ON GLACIERS

Snow ice and glaciers are perennial resource of fresh water and lifeline of the millions of people living in the down valley. They are not only important for drinking and agricultures use but have a vast potential for cheap hydro power generation. Shrinking of glaciers especially retreat and thinning may give rise to catastrophic hazards, like debris collection and landslides. ‘Excessive melt waters, often in combination with liquid precipitation, may trigger flash floods or debris flows’ (Jianchu *et al.* 2007:6). Glacial surges are another hazard in the north-west Himalaya. In the eastern and central Himalayas, where the glaciers’ surface are thickly debris covers, glacial melt associated with climate change has led to the formation of glacial lakes in open areas behind exposed end moraines, causing great concern (Jianchu *et al.* 2007:6). “The

receding glaciers left behind large pro-glacial lakes dammed, in some cases unstable natural dams (moraines). These moraine dams are comparatively weak and can breach suddenly, leading to the sudden discharge of huge volumes of water and debris. The resulting glacial lake outburst floods (GLOFs) can cause catastrophic flooding downstream, with serious damage to life, property, forests, farms, and infrastructure (Eriksson *et al.* 2009:8)."

Such a cataclysmic event occurred in June, 2013 when the Chorabari lake (moraine-dammed) outburst, which was located near the Chorabari Glacier snout (3860m alt.) about 1.5 km upstream the town of Shri Kedarnath. The lake breached and water hit the Kedarnath town and deposited millions of cubic meter unconsolidated moraine debris in and around the temple and downstream (Figure 8).

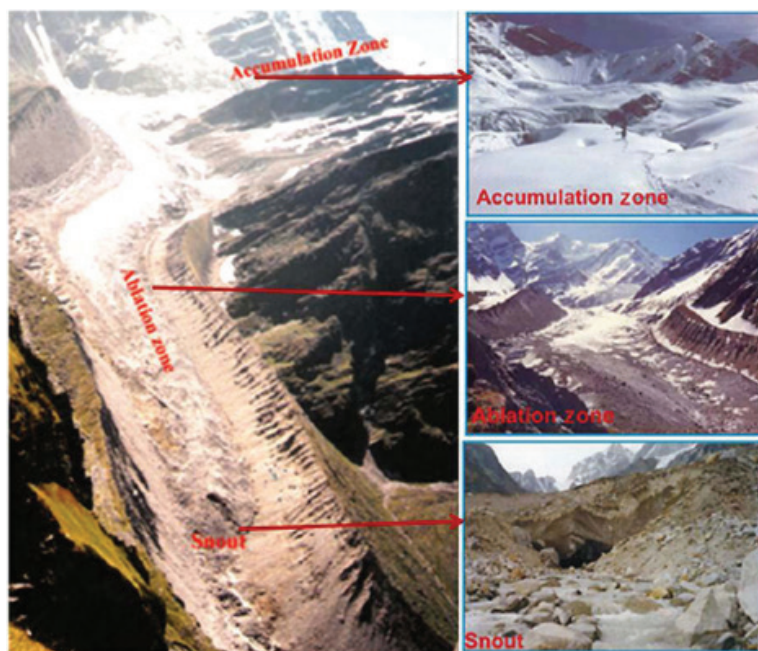


(Photo: Dobhal, 2013)

**Figure 8: View of Chorabari lake (Moraine dam lake) breached on 17 June, 2013 in Mandakini river basin**

The lakes are generally located in the High Mountain glacierised and periglacial region (above 3000m asl). There are few evidence of glacial lake flood reported in the region, for examples in 1930, a glacial lake outburst in the Arwa valley (north of Mana village) raised the Alaknanda water level to around 9 m near holy shrine of Badrinath and destroyed many houses. Similarly, during 1983, an area between Pandukeshwar and Hanuman Chatti was riddled with snow avalanches that not only caused the destruction to the villages but temporarily blocked the Alaknanda River (Sah *et al.*, 2005:176). Similarly Glacier Lake burst that occurred on 12<sup>th</sup> August 2007 in Alkapuri glacier caused huge destruction at Keshav Prayag (confluence of Alaknanda and Saraswati River near Mana Village). This also demolished a hanging bridge and a good chunk of agricultural fields got affected. Such flooding has also increased the siltation rate in the hydropower power projects in the downstream valleys.





**Figure 9 : A valley glacier showing different zones**

## **EFFECT OF HYDROPOWER PROJECTS ON GLACIERS AND GLACIAL ENVIRONMENT**

Broadly the main impacts imposed by Hydropower plants are on the existing physical environment, biological and social environment. Hydropower dams associated with the problems of deforestation, submergence, or rehabilitation impact on flora and fauna (aquatic and terrestrial), bio-diversity and also impinge on carrying capacity of modular ecosystems.

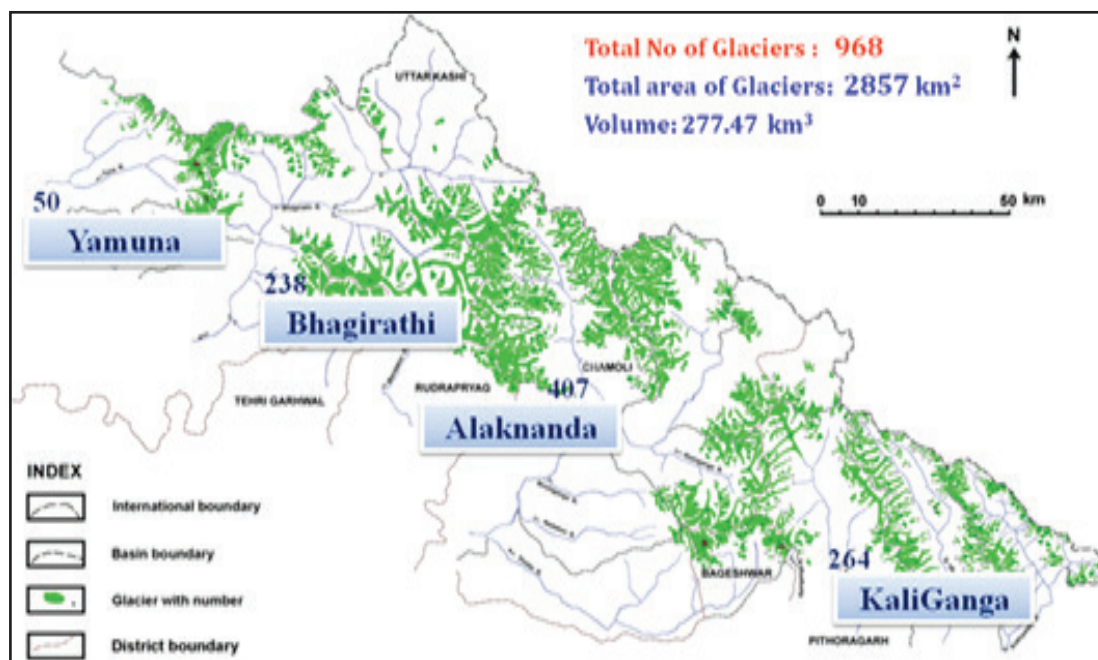
In the present scenario, the Himalaya is covered by ~10 percent glacier ice and additional nearly 30-40 percent area is seasonal snow covered. "The glaciers are dynamic and fragile in nature and are most sensitive to the temperature and precipitation changes that accompany climate change. The changes in their size and volume with time and space, serve as an indicator of regional and global climate change and also vulnerable to environments." (Zhou and Li, 2008:1057-1060)

A large area above >2500 m (asl) is occupied by glaciogenic sediments which are unconsolidated and fragile in nature and prone to remobilization under unusual weather events. In addition, the area is highly influenced by monsoon and snow/ glaciers melt processes as winter snow line descends down from an elevation between 2200 and 2500m in Uttarakhand. The stream emanating from glaciers and snow cover area facilitate snow avalanches, debris flows, landslides and particularly along the fast cascading juvenile streams. The direct consequences of such processes would also be exaggerated by a variety of direct/ indirect effects in mountain ecology. In such case, particularly in fragile nature of landscape

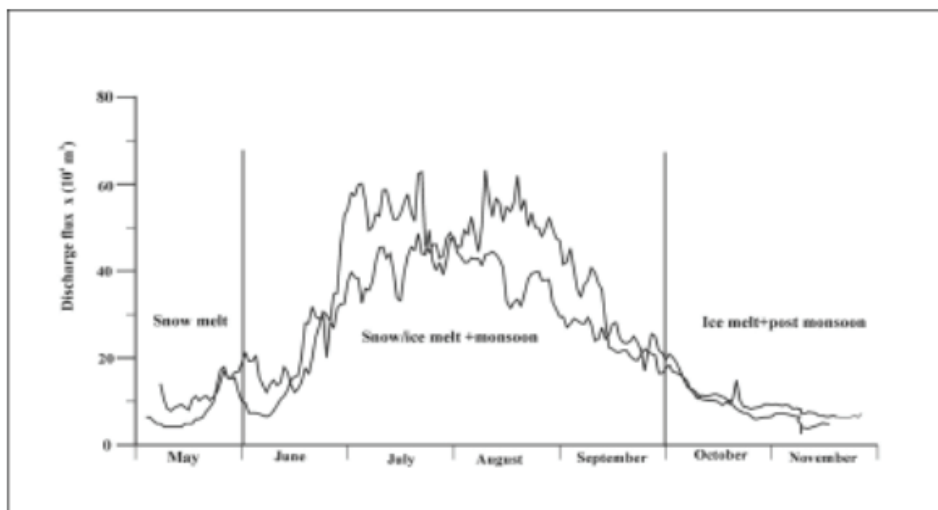
and continuous deposition of sediments by glacier retreat, the construction of large numbers of hydro-power dams should not be encouraged. However, noting the broad consequences of glacier variability on the agriculture production, hydro-power generation, drinking water supply and ecological system ultimately having implications in the livelihood, human health and resource development.

Rick Dinicola of US Geological Survey explains about glaciers as naturally regulated reservoirs that reduce the inter-annual runoff variability by increasing flow during summer and by storing water as ice and snow during winter. Changes in the size and volume of glaciers reflect the integrated response of a glacier to changes in precipitation and the surface energy budget that result from climatic fluctuation. Changes in glacier mass provide unique information on climate variability with space and time. “A glacier is a large mass of ice formed by the compaction and re-crystallization of snow, moving slowly down slope or outward by creep under the stress of its own weight (Douglas *et al.*, 2013: 1465).” Glacier can be differentiated into three zones, viz., the accumulation, ablation and terminus zones (Figure 9). Accumulation is the zone where ice is being continuously accumulated through snowfalls, ablation is the zone where the loss of glacier ice occurs by melting and terminus is the end of a glacier from where the melt water emerges and forms stream. The accumulation region is easily identifiable as a clear white snow/ice surface devoid of any plane moraines. (Raina, 2009: 9)

Uttarakhand has 968 glaciers covering surface area of 2,896 km<sup>2</sup>. They provide perennial fresh water to the Yamuna, Bhagirathi, Alaknanda and Kali river systems (Figure 10) and play a critical role in hydropower development in Uttarakhand state.



**Figure 10: Distribution of glaciers in different river basin of Uttarakhand Himalaya**



**Source:** Raina and Srivastava, 2008

**Figure 11: Contribution of discharge from glacierised area (1998 & 1999)  
(Dokriani Glacier, Bhagirathi river basin, Uttarakhand)**

## CONCLUSION

The resources made human life possible in the Himalaya. It is important to look at all the resources - land, forest, water, wilderness, cattle, humans together, and any development model has to be evolved around this holistic modulation of factors. All these resources are very intimately connected. These resources have been developed in millions of years and are the meticulous and magical works of the nature. First the birth of the Himalaya and later the evolution of its different constituents (rocks, metals, minerals, hydrocarbons to flora and fauna) is a unique handiwork of the nature. The Himalaya is the youngest mountain and still in making. Therefore its fragility, sensitivity and seismic behaviour are but natural. Himalayan ecological system is disturbed because of functional and ongoing HEP in Uttarakhand and number of spring water resources dryup due to tunnelling and blasting in unique ecological features. Hence the immediate stoppage of ongoing big HEP is required and more of Micro-hydel project should be encouraged. Water is vital requirement for our existence. Rivers are dying due to human induced causes, rain water conservation. Judicious use of riverine water and harvesting is the only way to make it alive. It is necessary to use water judiciously and give priority to drinking first, followed by cultural use (sacred bath, religious-cultural rituals, etc.), irrigation, water milling, hydro-power generation, industrial use and packaging purposes (Alter, 2001). The priorities should not be altered and wherever possible the hydro-power generation and packaging of water should also be done under community ownership. As the study of history tells us that the use of water for drinking, irrigation and water milling purposes never posed a threat to the resource or the river itself but large irrigational canals, HEPs, urbanization and commercial packaging do pose a grave threat.



**Table 4: Rivers and the biodiversity sites likely to be affected by the 24 proposed projects in the Alakananda and Bhagirathi basins**

Sub-basin Proposed	HEPs to be excluded	River/ Stream (gad)	Biodiversity Impacts	Remarks
Bhagirathi I	Karmoli (140 MW)	Jadhganga	Terrestrial	The HEPs are located within the Gangotri NP and within the Gangotri Eco-sensitive Zone notified by MoEF and are likely to cause irreversible impacts on wildlife species and habitats
	Jadhganga (50 MW)	Jadhganga	Terrestrial	
Bhagirathi II	Bhairon ghati (381 MW)	Bhagirathi	Terrestrial	The HEP falls within the Gangotri NP and within the Gangotri Eco-sensitive Zone notified by MoEF and are likely to cause irreversible impacts on wildlife species and habitats
	Jaland-harigad (24 MW)	Jaland-harigad	Terrestrial	These HEPs fall within important wildlife habitats connecting Protected Areas, and also falls within the Gangotri Eco-sensitive Zone notified by MoEF and are likely to cause irreversible impacts on wildlife species and habitats
	Siyangad (11 MW)	Siyangad	Terrestrial	
	Kakoragad (12.50 MW)	Kakoragad	Terrestrial	
Bhagirathi IV	Kotlibhel 1A# (195 MW)	Bhagirathi	Aquatic	High Impact Potential
Balganga	Balganga II (7 MW)	Balganga*	Aquatic	Balganga identified as critical aquatic habitat for fish and hence proposed as 'Fish Conservation Reserve' and these HEPs are likely to cause irreversible impacts on wildlife species and habitats
	Jhalakoti (12.50 MW)	Balganga*	Aquatic	
Mandakini	Rambara (76 MW)	Mandakini	Terrestrial	This HEP is located within Kedarnath WS and is likely to cause irreversible impacts on wildlife species and habitats

Alaknanda I	Kotlibhel 1B (320 MW)	Alaknanda	Aquatic	Likely to have High Impact Potential and would cause irreversible impacts on wildlife species and habitats
Alaknanda II	Urgam (5 MW)	Kalp ganga	Terrestrial	Falls within important wildlife habitats connecting Protected Areas
Alaknanda III	Alaknanda (300 MW)	Alaknanda	Terrestrial	Falls within the buffer zone of Nanda Devi Biosphere Reserve and are located in important wildlife habitats that connect Protected Areas. These HEPs are within 10 km from the Valley of Flowers, a UNESCO World Heritage Site and would cause irreversible impacts on wildlife species and habitats
	Khironi Ganga (4.00 MW)	Khironi Ganga	Terrestrial	
Bhyundar Ganga	Bhyundar Ganga (24.30 MW)	Bhyundar Ganga*	Terrestrial	Falls within buffer zone of Nanda Devi Biosphere Reserve and in important wildlife habitats connecting Protected Areas, and within 10 km from the Valley of Flowers, may cause irreversible impacts on wildlife species and habitats
Dhauli-ganga	Malari-Jhelum (114.00 MW)	Dhauli-ganga*	Terrestrial	falls within Nanda Devi Biosphere Reserve and important wildlife habitats connecting Protected Areas. These HEPs are within 10 km from the Nanda Devi NP - UNESCO Natural World Heritage Site and would cause irreversible impacts on wildlife species and habitats
	Jhelum-Tamak (128.00 MW)	Dhauli-ganga*	Terrestrial	
	Tamak-Lata (280 MW)	Dhauli-ganga*	Terrestrial	
	Lata-Tapovan (171 MW)	Dhauli-ganga*	Terrestrial	

Rishiganga	Rishiganga I (70 MW)	Rishi ganga*	Terrestrial	falls within the Nanda Devi National Park – UNESCO Natural World Heritage Site and would cause irreversible impacts on wildlife species and habitats
	Rishiganga II (35 MW)	Rishi ganga*	Terrestrial	
Birahi Ganga	Birahi Gan- gaI (124 MW)	Birahi Ganga*	Terrestrial & Aquatic	likely to have high impact and would cause irreversible impacts on wildlife species and habitats
	Gohana Tal (50 MW)	Birahi Ganga*	Terrestrial & Aquatic	
Ganga	Kotlibhel II (530 MW)	Ganga	Terrestrial & Aquatic	likely to have very high impacts and would cause irreversible impacts on wildlife species and habitats
13 Sub basins	24 HEPs			

\* The IMG in its report (2013) had recommended that some river segments of Alaknanda and Bhagirathi should be maintained in pristine form. Six rivers viz., Nayar, Balganga, Rishiganga, Asiganga, Dhauliganga (upper reaches), Birahi Ganga and Bhyundar Ganga were identified to be kept in pristine form.

# Recommended to be dropped from the list of 24 HEPs.

## ENDNOTES

1. Data from Energy Statistics 2013, CSO, Ministry of Statistics & Project Implementation, GoI, New Delhi, 2013
2. According to a 1987 hydropower reassessment survey by CEA, Himachal Pradesh has slightly higher potential. The latest data for Uttarakhand provided by UJVNL, however, shows that Uttarakhand's potential has been revised substantially.
3. <http://www.gangaaction.org/in-the-news-dams-without-responsibility/>
4. Source: [www.gangaahvaan.org](http://www.gangaahvaan.org)

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## TOURISM IN HIMACHAL PRADESH: AN EVALUATION OF KANGRA REGION

Manoj Sharma\*

### ABSTRACT

*Tourism in Himachal Pradesh is recognized as one of the most important sectors of the economy. Tourism can provide boost to economic growth for future. The present study seeks to analyze the primary and secondary data collected from the Kangra region of Himachal Pradesh. The major objectives of the study are to examine the purpose of tourists' visit in the region and evaluate the existing facilities available for making the tourist comfortable. Chi square test, standard deviation and means are applied for the justification of primary and secondary data. The study reveals that the tourist inflow in state over 2006-2012 period has witnessed increase in both domestic and foreign segments. In 2014, the tourist arrival from the foreign countries gradually decreased i.e. -5.93 percent, while on the other hand arrival of domestic tourists has seen continuous increases and the respective figure for the year is 8.22 percent. This study concludes with a number of recommendations, inter-alia, how the tourism industry regulators and policy makers can improve the effectiveness and efficiency of the tourism industry in the state and specifically in the Kangra region.*

**Keywords:** Chi-Square, Hamirpur, Kangra, Shimla, Standard Deviation, Tourist spot.

### INTRODUCTION

Himachal Pradesh is one of the leading states in the field of tourism in India. Since last decade, there has been sharp increase in the inflow of tourists in Himachal Pradesh. The main strengths of tourism in the state are its history, tradition, culture and the beautiful spots like Kullu, Manali, Chamba, Dalhousie, Khaziyar (known as mini-Switzerland of India), Shimla, Kufri, Naldhera and Dharamshala. State is endowed with all the basic resources necessary for thriving tourism activities like geographical and cultural diversity, clean and beautiful streams, sacred shrines, historic monuments and the friendly, hospitable and peace-loving people. From the last one and half decade, Kangra region and Shimla are developing as 'must visit' tourist destinations in India.

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It is a fact that the state is endowed with abundant natural beauty and attractions, yet there are certain areas, which have remained unnoticed and there is enough scope to tap its potential. Similar observations have also been noticed from the studies conducted by Jayasheela and Hans (2007), Kumar (1992), Dutta (1996), Mishra and Acharya (1981), Jackson and Davis (1997), Singh and Ahuja (2011) that India has vast potential for the development of tourism in Himachal Pradesh. Himachal Pradesh stands at 9th position in terms of foreign tourist arrivals with a share of 2.41 percent of foreign tourists to India. The performance of Himachal Pradesh in attracting tourists has been better than the national average growth. Keeping in view the above facts, there was a need to undertake a study to evaluate the purposes of tourists visit and also to evaluate the existing facilities available to the tourists at Kangra region, one of the fast growing tourist destination of Himachal Pradesh. The present study was conducted with the following objectives:

### **OBJECTIVES**

1. To study the tourists' inflow in India;
2. To examine the district wise tourists' inflow in Himachal Pradesh;
3. To evaluate the existing facilities available to the tourists' at Kangra region;
4. To identify the problems experienced by the tourists' and to give suggestions to improve the tourism in the state.

### **METHODOLOGY**

The sample for the present study consisted of the tourists visiting Kangra region. The process of selecting the sample was multistage in nature. At the first stage, four representative tourist places in Kangra region namely Dharamshala city, Mcleodganj, Kangra city and Chamunda Mandir had been selected with the help of convenience sampling. At the second stage, a sample of 150 tourists was taken. The sample includes domestic as well as foreign tourists and these respondents were selected on the basis of convenience. To collect the data, a schedule was prepared and administered to the tourists. In order to explore and tap the issue and concerns related to tourism in Kangra region, tourist guides, social workers and influential personalities of the area were contacted for the opinion survey. Certain information was collected through observations. Consistent with the objectives of the study, different techniques like simple percentage, mean, standard deviation, skewness and chi-square test etc. have been used to analyse the data.

### **RESULTS AND DISCUSSION**

#### **Tourists' Inflow in India**

Table 1 reveals the data of the top ten most visited States of India by the foreign tourists. Maharashtra with 24.7 percent share of foreign tourist was found at the first place followed by Tamil Nadu with 17.18 percent share of the foreign tourists. Delhi with 11.32 percent share of the foreign tourist was placed at third place followed by Uttar Pradesh with 9.62 percent whereas Rajasthan with 7.00 percent share is found at fifth place and Himachal Pradesh now ranks at 10<sup>th</sup> position (2.41 per cent) in terms of foreign tourist arrivals in India.

**Table 1: Tourists' Inflow in India (2012)**

Rank	State/UT	Foreign Tourist	
		Number	Percentage Share (%)
1	Maharashtra	5120287	24.7
2	Tamil Nadu	3561740	17.18
3	Delhi	2345980	11.32
4	Uttar Pradesh	1994495	9.62
5	Rajasthan	1451370	7
6	West Bengal	1219610	5.88
7	Bihar	1096933	5.29
8	Kerala	793696	3.83
9	Karnataka	595359	2.87
10	Himachal Pradesh	500284	2.41
	Total of Top 10 States	18679754	90.1
	Others	2051741	9.9
	<b>Total</b>	20731495	100
Mean	1.86		
Std. Dev.	1.47		

**Source:** *India Tourism Statistics 2012*, Government of India: Ministry of Tourism, Market Research Division.

The performance of Himachal Pradesh in attracting tourists has been found better than the average growth in number of tourists across India. However, the current rank of 10 in terms of number of tourists visiting the state in 2012 indicates that there is further potential which may be leveraged by showcasing the State as an important tourist destination. The value of mean is 1.86 which is found very least and on the other side standard deviation is 1.47 which indicates large variations about the profile of tourism among the different states of India.

#### **District-wise Tourists' Inflow in Himachal Pradesh**

It is revealed from the Table 2 that Kullu with 19.35 per cent domestic tourist inflow within Himachal Pradesh is at the top followed by Shimla with 19.04 per cent share, Kangra (13.99), nearly 8.33 per cent of the tourists visited Una district during 2015-16, Chamba was visited by 6.55 per cent of domestic tourists followed by Mandi, Solan, Sirmour, Hamirpur, Kinnaur and Lahaul & Spiti.

**Table 2: Tourists' Arrival in Himachal Pradesh(2015)**

District	Domestic tourist	%	Foreign tourist	%	Total	Total %
1.	2.	3	4	5	6	7
Bilaspur	1368807	7.99	350	0.086	1369157	7.809
Chamba	1122894	6.55	1197	0.295	1124091	6.411
Hamirpur	855263	4.99	4	0.000	855267	4.878
Kangra	2396970	13.99	112843	27.78	2509813	14.316
Kinnaur	117216	0.68	2695	0.664	119911	0.683
Kullu	3314463	19.35	109468	26.95	3423931	19.53
Lahaul & Spiti	86591	.506	4612	1.135	91203	0.520
Mandi	1086231	6.34	10478	2.580	1096709	6.256
Shimla	3261152	19.04	154155	37.95	3415307	19.48
Sirmaur	1016060	5.93	3377	0.821	1019437	5.815
Solan	1072486	6.26	6692	1.648	1079178	6.155
Una	1426912	8.33	237	0.58	1427149	8.141
<b>Himachal Pradesh</b>	17125045	100	406108	100	17531157	100

**Source:** Himachal Pradesh Economic Survey Report 2015-16.

Further, the above data reveals that, Shimla was visited by 37.95 per cent foreign tourists during 2015-16, followed by Kangra with 27.78 per cent of the tourists, and Kullu was found at third place during same period. Mandi was visited by 2.58 per cent of the tourists during 2015-16, followed by Solan with 1.648%, Lahaul & Spiti (1.135%), Kinnaur (0.664%), Una (0.58%) and Hamirpur was visited by 4.8% tourists during 2015-16.

### **Tourists' Perception Regarding Basic Facilities**

The responses of the tourists towards the quality of food available in Kangra region and its surrounding places are given in Table 3. Only 12 percent tourists rated the quality of food as poor while 26.7 percents of respondents kept their opinion reserved over the issue of quality of food available at tourist spots. Mean score and standard deviation also supported the fact that quality of food on an average was good. The chi-square value (26.93) was also found significant about the perception of tourists on the quality of food at the region.

**Table 3: Perception of Tourists about the Facilities**

Services	Perception of Tourists about the Facilities					Total	Mean	S.D.	Chi-square	P-Value.
	Excellent	Good	Neutral	poor	Very poor					
Quality of Food	20 (13.3)	50 (33.4)	40 (26.7)	18 (12)	22 (14.6)	150 (100)	2.81	1.24	26.93	.000
Sanitary Services	18 (12)	48 (32)	50 (33.4)	20 (13.3)	14 (9.3)	150 (100)	2.73	1.09	45.86	.000
Water Supply	15 (10)	62 (41.4)	45 (30)	10 (6.6)	18 (12)	150 (100)	2.69	1.12	67.26	.000
Road Condition	12 (8)	58 (38.6)	30 (20)	25 (16.7)	25 (16.7)	150 (100)	3.02	1.32	17.26	.002
Power Supply	55 (36.7)	60 (40)	10 (6.6)	15 (10)	10 (6.6)	150 (100)	2.12	1.22	81.73	.000
Banking Services	35 (23.3)	45 (30)	30 (20)	25 (16.7)	15 (10)	150 (100)	2.59	1.28	17.06	.002
Police Services	28 (18.7)	30 (20)	15 (10)	47 (31.3)	30 (20)	150 (100)	3.13	1.43	15.20	.004
Medical Services	40 (26.7)	70 (46.6)	10 (6.6)	20 (13.3)	10 (6.6)	150 (100)	2.26	1.18	86.66	.000

**Source:** Field Survey 2015-16.

**Figures:** in parentheses show the percentage to total.

About 33.4 percent of the respondents were found neutral about the quality of sanitary services. A large number (32%) of the respondents considered it good, followed by 13.3 percent rating poor, while 12 percent considered it excellent and the remaining 9.3 percent considered it very poor. The opinion of the tourists reflected a wide variety of responses regarding the quality of sanitary services at different tourist destinations. Mean score also supported the findings, while standard deviation was found more than one which indicates more variation among the perception of the respondents. The value of chi-square (45.86) brought out that there was a significant difference among the perception of respondents.

Availability of safe drinking water gives boost to the development of tourism at any place and it was revealed from the study that 41.4 percent tourists considered water supply as good, 30 percent noted to be neutral and 12 percent found it to be very poor. 10 percent tourists found the quality of potable water as excellent and only 6.6 percent of the tourists considered it poor. Mean score also supported the findings while the standard deviation was found 1.12 which indicates large variation among the perception of the respondents

about the drinking water at Kangra region. Calculated value of chi-square (67.26) revealed that there was a significant difference in the opinion of tourists regarding the availability of services of drinking water and there was a need to ensure uninterrupted supply of quality water.

The good network of roads plays a vital role in tourism development. All tourist destinations should be linked with a network of good condition roads to ensure smooth traffic of tourists. It was found that 38.6 percent tourists had perceived the same in good conditions, 20 percent noted to be neutral, 16.7 percent considered poor and equal number of tourists found it very poor and about i.e. 8 percent considered it excellent which was also supported by mean and standard deviation. However, there was a need to maintain the roads in good condition throughout the year.

Electricity and power supply position was considered satisfactory at different tourist destinations under the study. Nearly 40 percent of tourists considered power supply good, 36.7 percent found it to be very good, 10 percent noted it to be poor, 6.6 percent neutral and equal number considered it very poor. Mean score and standard deviation also supported the study and showed that there was a significant difference in the opinion of tourists regarding the electricity and power services available at different places in the selected study area.

Further, it is noticed from the study that about 30 percent of the respondents considered the banking services good, almost 23.3 percent considered it excellent, nearly 20 percent were neutral on this issue while 16.7 and 10 percent revealed it to be poor and very poor respectively. Mean and standard deviation also supported the fact that banking services in the region were good. Calculated value of chi-square at 17.06 was more than table value at 5% percent level of significance and indicated that there was a significant difference in the opinion of tourists regarding the banking facilities available in the study areas. Police services were considered as poor by 31.3 percent tourists while 18.7 percent of the tourists considered it very good. Medical services were rated well by the tourists as majority chunk of the tourists (46.6 percent) considered it good.

## **CONCLUSION**

The tourist inflow in the state over 2006-2012 period has witnessed increase in both domestic and foreign tourists. In 2014, the tourist arrival from the foreign countries has gradually decreased i.e. (- 5.93 % in 2014), and on the other hand domestic tourist arrival has seen continuous increases i.e. 8.22 % .The majority of tourists visited Kangra region for the purpose of pleasure and holiday relaxation. Food was considered good by about one third of the tourists. There was a need not only to make provision for safe drinking water at all tourist destinations but also to ensure uninterrupted supply of water. However, there was a need to keep the roads in good condition throughout the year. Electricity and power supply position was considered satisfactory. A large number of tourists were attracted towards Kangra region by its natural beauty, cool and pleasant climate. Hence, the charm of natural images such as good climate, scenic beauty and hilly terrain are the main causes which brought tourists to Himachal Pradesh.

## RECOMMENDATIONS

In order to strengthen tourism in the region, exploitation of tourists by the locals must be minimized. Entertainment facilities should be enriched in order to ensure a longer stay of tourists. More playgrounds and parks ought to be made available. Basic infrastructural facilities have to be developed further. Condition of roads should be improved. Adequate parking space may be made available to the tourists at the tourist places. Entry fee and other dues charged by the local authority at tourists place need to be curtailed in order to boost tourism.

Parking space must be provided. Other basic necessities must be provided and diverse range of culinary choices must be provided to cater to the wants of tourists from various places across India and the globe. Information must be available to tourists at all places and local culture and handicrafts should be promoted. Good, fast, economical and easily accessible banking, medical and police services should be made available in different tourist destinations to avoid any hardships to the tourists.

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# ANALYSIS OF SHORT TERM FINANCIAL LIQUIDITY POSITION OF PUBLIC MANUFACTURING AND TRADING ENTERPRISES: EMPIRICAL EVIDENCE FROM NEPAL

**Dr. Bihari Binod Pokharel\***

**Nischal Risal\*\***

## ABSTRACT

*The paper aims to provide empirical evidence on the short term financial liquidity position of public manufacturing and trading enterprises in Nepal. The sampling technique is used to select a panel data on 13 public manufacturing and trading enterprises for the period of 2000-2010, which led to total of 138 enterprise-year observations. The result shows that the shorter is the cash conversion cycle, the more profitable the firm is likely to be. The result also shows that the increase in payable deferral period and receivable conversion period lead to the increase in gross profit margin. The gross profit margin increases with decreases in inventory conversion period. Majority of the selected public enterprises are following aggressive working capital policy. In addition to this, Nepali public manufacturing enterprises and trading enterprises are not able to manage liquidity in effective way. The liquidity position of public trading enterprises was found better in comparison with liquidity position of public manufacturing enterprises. The analysis revealed that the net working capital utilization was very poor in public manufacturing enterprises as compared to public trading enterprises. The analysis highlights the importance of managing working capital requirements to ensure an improvement in enterprises profitability.*

**Keywords:** Liquidity, profitability, public enterprises, working capital

## INTRODUCTION

The important theoretical developments in financial management during the past few decades have provided the potential for improved decisions in business organizations. Unfortunately,

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developments have not been uniform across all the areas of financial decision making, within and between business organizations. Working capital appears to have been relatively neglected in spite of the fact that a high proportion of the business failures is due to poor decisions concerning the working capital of the enterprises. Working capital management is the most imperative and crucial aspects of short-term financial matters of an organization. In a perfect financial management, working capital assets and liabilities are not necessary because there is no uncertainty, no transaction costs, and no scheduling costs of production or constraints of technology. The capital, labor and product markets reflect all available information and become perfectly competitive (Smith, 1976). In such an ideal business world, there is little need to hold any form of inventory other than a limited amount of goods in process during production.

An ideal business assumes that demand is exactly known in advance, that suppliers keep to their due dates, production can be smoother and orders executed directly without costs and delays. There is no need of holding cash for working capital other than for the initial costs, because it can be possible to make the payment from every receipt of sales. However, problems of working capital exist because these ideal assumptions are never realistic. Therefore, working capital levels make a significant part of an enterprise's investment in assets.

Enterprises of all size demonstrate sensitivity of their product performance to the efficient management of their working capital. However, which category of enterprises (large or small) exhibit relatively more responsiveness to proficient working capital management is obscure. In larger enterprises, efficient working capital management can significantly affect the enterprise's risk, return and share price. Enterprises may have an optimal level of working capital that maximizes their value. Sagan (1955) indicated the need to build up a theory of working capital by raising useful questions which require the study of working capital in depth, for which answers are not available. The efforts to build up a theory of working capital came with the emergence of study by Walker (1964). Van Horne (1969) recognized working capital as an area largely lacking in theoretical perspective. Van Horne developed a useful framework with the help of which, one can point out the best alternative among the several ones while conducting the risk-return analysis of working capital position. Smith (1974) observed that theoretical developments in finance ignored the area of working capital management. Smith had described the dual goals of profitability and liquidity. The major inference of the studies concerning approaches to working capital management centers on risk-return tradeoff. It simply attempts to develop an approach with the help of which risk-return analysis of working capital position can be conducted for selected public manufacturing and trading enterprises of Nepal. For this purpose, various working capital policies have been grouped into aggressive, conservative and moderate policy. Hence, working capital management efficiency is vital for manufacturing and trading enterprises, where a major part of assets is composed of current assets (Van Horne & Wachowitz, 2004).

Working capital management is an area in making the liquidity and profitability comparisons among enterprises (Eljelly, 2004). It directly affects the profitability and liquidity of the enterprises (Raheman & Nasr, 2007). It means the need for effective working capital management has become greater in recent years. Enterprises finance the total investment in assets with debt and/or owner's equity, the supply of which is limited. However, liquidity and

profitability management comes to the picture when an enterprise is faced with the dilemma of using short-term financing sources and investing in working capital levels. Liquidity and profitability management requires fine tuning because they have offsetting risk-profit effects. The combination of liquidity and profitability depends upon management's risk attitude, based on which it can use maturity matching aggressive or conservative approach. An excessive investment in working capital lowers the rate of return while inadequate investment hampers the solvency position and growth, thereby affecting the smooth operation of business. The need for skilled working capital management practice has thus become greater in recent years.

## **STATEMENT OF THE PROBLEMS**

Most of the enterprises extensively use trade credit despite its apparent greater cost. Even in UK's corporate sector more than 80 percent of daily business transactions are on credit terms (Summers & Wilson, 2000). Eventually, the management of working capital necessitates short term decisions in working capital and financing of all aspects of both enterprise's short-term assets and liabilities (Mohammad & Saad, 2010). The facts that corporations do not exist without working capital is thus, undeniable. Consequently, it involves crucial decisions on multiple aspects, including managing account payables, account receivables, preserving a certain level of inventories and the investment of cash available.

In this process, the asset-liability mismatch may occur and it may increase the enterprise's profitability in the short run but at a risk of its bankruptcy (Long, Malitz, & Ravid, 1993). Higher liquidity gives the comfort of meeting short term liabilities at the cost of profitability and too little of it may increase the profitability at a greater risk of not meeting the short run obligations. The effective working capital management is essential for the increase in the corporate efficiency in terms of profit and other measures (Shin & Soenen, 1998; Deloof, 2003; & Quayyum, 2012). The management of receivables, inventory, and accounts payables has tremendous impact on cash flows, which in turn affect the profitability of enterprises (Cote & Latham, 1999). The enterprises which are better at managing working capital, have been found to be able to make counter cyclical moves to build competitive advantage (Siddiquee & Khan, 2009).

Raheman *et.al.* (2010) had used the model specification as Pearson Correlation method, and used balanced panel data of manufacturing enterprises listed at Karachi Stock Exchange. They developed an empirical framework on working capital management based on literature of Deloof (2003) and subsequent work of Padachi (2006). It was found that, enterprises were following conservative working capital management policy and concentrate on improving their collection and payment policy. It was suggested that indicators of working capital management had a perceptible impact on profitability of the enterprises (Afeef, 2011). Therefore, there is a need to develop sustainable working capital management practices in Nepali context.

A trade-off between risk and return, thereby following neither an aggressive nor a conservative approach was found in Nepali context in public enterprises (Pradhan, 1986). Almost all the selected enterprises had a positive networking capital and the negative working capital was observed in a few cases. No proper consistency was existed in between liquidity position and turnover of assets. It was a surprising result that public enterprises with lower turnover had the higher liquidity position. Thus, the desired trade-off between liquidity versus profitability in

order to maximize the value of an enterprise becomes necessary (Anand & Gupta, 2003). This study therefore was concentrated towards the study of working capital management practices in Nepali public manufacturing and trading enterprises. So, the objective of this study is to examine the short term liquidity position of Nepali public manufacturing and trading enterprises.

## RESEARCH METHODS

The research design adopted in this study consists of descriptive and causal comparative research designs to deal with the issue related to short term financial liquidity position. The descriptive research design was adopted to undertake fact-finding operation searching for adequate information in the context of working capital management practices in Nepali public manufacturing and trading. The systematic collection and presentation of data give a clear picture of a particular situation and attempt to obtain a complete and accurate description relating to working capital management practices.

### Population and Sample Size

According to the recent report from the Ministry of Finance, there were 37 public enterprises in the country. For this study, all the public enterprises operating in Nepal were considered as population. The seven public manufacturing enterprises and six trading enterprises were taken as sample. The samples were selected using judgmental sampling techniques. Hence, total 13 enterprises were selected for the analysis and study.

### Nature and Sources of Data

The data obtained through published Annual Reports of enterprises, Office of the Auditor General, Annual Reports from the Government, Nepal Stock Exchange, Ministry of Finance and Security Board of Nepal were taken as secondary data. The selections of enterprises based on judgmental criteria are presented in Table 1 and Table 2.

**Table 1: Selection Criteria for Enterprises**

S.	Activities	Criteria
1	Selection norms	The enterprises established before 2000 were included in the study.
2	Nature	The enterprises related to public utility, service sector, banking sector etc., were excluded from the study.
3	Sale of the enterprises	The enterprises which were sold to private party, during the study period, excluded from the study.
4	Financial statements	Those enterprises, whose financial statements were not obtained for more than 5 years, were excluded from the study.
5	Loss or profit	The enterprises incurring losses for last several years were excluded from the study.
6	Liquidation	The enterprises which were liquidated during the study period, excluded from the study.
7	Private/Public	Only public manufacturing and trading enterprises were included in the study.



The data was collected on panel data methodology basis. The total number of observation was 138 firm-year observations. Among the 37 enterprises, the study was confined to only 13 enterprises. These enterprises selected for the study were representative of large and small enterprises, i.e., 35 percent out of the total population.

**Table 2: List of Selected Public Enterprises and Study Period**

<b>Name of the Company</b>	<b>Study Period</b>	<b>Number of Firm-Year Observations</b>
<i>Public Trading Enterprises</i>		
Agriculture Input Company Ltd (AIC)	2000-2010	11
National Seeds Company Ltd (NSC)	2005-2010	6
National Trading Corporation Ltd (NTC)	2000-2010	11
Nepal Food Corporation Ltd (NFC)	2000-2010	11
Nepal Oil Corporation Ltd (NOC)	2000-2010	11
The Timber Corporation of Nepal Ltd (TCN)	2000-2010	11
<i>Public Manufacturing Enterprises</i>		
Dairy Development Corporation (DDC)	2000-2010	11
Herbs Production and Processing Co Ltd (HPPC)	2000-2010	11
Hetauda Cement Industry Ltd (HCI)	2000-2010	11
Janakpur Cigarette Factory Ltd (JCF)	2000-2010	11
Nepal Drugs Ltd (ND)	2000-2010	11
Nepal Orind Magnesite Private Ltd (NOMP)	2000-2010	11
Udayapur Cement Industry Ltd (UCI)	2000-2010	11
<b>Total Observation Period</b>		138

## METHOD OF ANALYSIS

The analysis of secondary data was carried out by application of SPSS and GRETL data analysis software. The percentage, mean, standard deviation, maximum and minimum results in each variable have been described in this study. The various ratios calculated were grouped into liquidity ratios, ratios used in assessing structure of working capital and ratios used in assessing working capital utilization. Financial ratios are designed to evaluate a financial

statement. The short term liquidity position of the enterprise is measured by liquidity ratios. Net working capital itself is one of the measures of determining liquidity. An enterprise with more net working capital is considered more liquid than one with less net working capital (Brigham & Ehrhardt, 2012). The current ratio and quick ratio measures are most commonly used measure. The short-term liquidity of an enterprise is measured by the degree to which current ratio and quick ratio can meet its short-term obligations. The consequences of inadequate short-term liquidity are very serious and therefore measures of such liquidity have been attached greater importance. These ratios were used in the studies of Bernstein (1978); Kolb (1983); Pradhan (1986); Teruel & Solano (2007); Sharma (2007); Singh & Asress (2010); Mohamad & Saad (2010); Afeef (2011); and Quayyum (2012).

In addition to current and quick ratios, an additional ratio of cash to current liabilities was used to assess the liquidity position. This cash to current liabilities ratio indicates how much cash is available to pay current obligations. The ratio shows whether the level of cash maintained by the enterprise is greater or less than the current liabilities (Brigham & Ehrhardt, 2012). The low level of current and quick ratios may indicate extraordinary managerial capabilities rather than reflecting financial weakness. An enterprise may operate on low cash balances using the funds generated from operations to meet short-term liabilities. The liquidity ratios are therefore required to consider the cash flows or earnings. This is particularly important when current liabilities are greater than current assets or quick assets (Pradhan, 1986).

In the context of Nepal, data scarcity is acute. Updated and complete data are limited due to the manual data management system prevailing in the country. There is no automated central data bank and this makes it difficult to conduct any research in Nepal. In order to make a study on working capital management more fruitful, it is essential that data should be of frequent time intervals. Hence, such type of weekly or monthly data could not be obtained and due to this, the study had forced to use the annual data which were available in profit and loss accounts and balance sheets. So, pooled cross sectional panel data had used in this study due to unavailability of time series data of Nepali enterprises in systematic and appropriate way. The financial institutions, hotels and trading enterprises were excluded from the study. It implies that the conclusions drawn are of a tentative nature and enterprise generalization should be avoided for the entire enterprises in the public sector. At the time of conducting this study, secondary data were available only up to 2010. It was due to the fact that most of the selected enterprises have not prepared and audited their financial statements in time.

## **RESULTS**

The measure of central tendency, variation and shape are discussed in this section. i.e., the mean, median, minimum and maximum values with standard deviation of different variables in the model during the period 2000-2010 have been presented in the Table. Table 3 presents descriptive statistics of different variables. The net profit margin on average was 15.55 percent whereas return on asset was found to be negative (-5.20 percent). Gross margin on average was negative 13 percent of sales while the median was found 0.08 percent.

**Table 3: Descriptive Statistics of Variables for Manufacturing and Trading Sector**

	NPM	ROA	GM	SALES	CR	DR	SG	ICP	RCP	PDP	CCC
Mean	0.15	-0.052	-0.13	273.32	1.48	0.58	0.005	214	173	474	230
Median	-0.03	-0.075	-0.0008	213.64	1.03	0.52	0.003	182	54	403	55
SD	0.54	0.131	0.44	161.29	1.62	0.29	0.009	249	400	555	613
MIN	-0.09	-0.19	-1.47	108.62	0.61	0.28	-0.001	1.46	0.21	1.29	776
MAX	1.76	0.31	0.003	578.31	3.96	1	0.23	1650	2717	3272	3626

**Note:** In this table, NPM is (net profit/sales), ROA is (net income/total assets), GM is (sales-cost of sales)/sales. RCP is (account receivable\*360)/sales. ICP is (inventories\*360)/cost of goods sold. PDP is (account payable\*360)/purchase. CCC is (number of days account receivable + number of days inventories – number of days account payable). Sales are expressed in thousands of Nepali currencies. SG is calculated as (this year's sales- previous year's sales)/previous year's sales. CR is current assets/current liabilities. DR is total debt/total assets.

The average cash conversion cycle was very high in Nepali Public manufacturing and trading enterprises i.e. 239 days (median was 55 days). It indicated that the enterprises were cumulating their account receivables since long time ago. It also indicated an ineffective management of inventories. Hence enterprises were unable to manage working capital in good way. It was found that enterprises were receiving their payment on credit sales after an average of 173 days (the median was 54 days). The study has found that average of 214 days were taken by enterprises to convert or sell the inventories and enterprises wait on average of 474 days (median was 403 days) to pay their purchases. The enterprises current ratio of 1.48 times was found. The study has found mean sales growth rate of 53 percent, while median sales growth rate on sales was 29 percent. The debt ratio on average was nearly 60 percent found, while the median debt ratio was 52 percent. The study found the maximum rate of gross profit margin at 0.3 percent and minimum rate negative at 114 percent.

A negative net working capital was observed for eight enterprises. The majority of the public trading enterprises and manufacturing enterprises had negative net working capital. DDC, HPPC, JCF, NSC, NTC, ND, NOMP, and UCI had negative net working capital. The average net working capital of Nepali public trading enterprises and manufacturing enterprises was quite low. The net working capital fluctuated widely from one public enterprise to another public enterprise. It was also found that average NWC of public trading enterprises was positive whereas average NWC of manufacturing enterprises was negative. The CR and QR of public trading enterprises were found better than CR and QR of public manufacturing enterprises. This means, liquidity position of public trading enterprises was found better in comparison with liquidity position of public manufacturing enterprises.

Since the net working capital is the excess of current assets over current liabilities and current assets comprised illiquid inventories. Therefore, the quick net working capital was

computed in the assumption that it is more relevant than net working capital. The quick net working capital (QNWC) has been presented in Table 4. Table reveals that quick assets were insufficient to cover the current liabilities. Only, HCI had covered current liabilities from the quick assets. Other twelve manufacturing enterprises and trading enterprises had negative quick working capital.

The net working capital and quick net working capital could not be taken as a powerful measure to assess the liquidity position of the selected enterprises because they did not show the extent of margin of safety provided to current creditors. Due to this, current ratio and quick ratio were regarded as better than these measures. The current ratios are similar to net working capital. The current ratio presented in Table 4 indicates that the largest current ratio was for NSC. The high current ratios, however, need not indicate higher liquidity maintained by the enterprises. If the current assets comprise such assets which cannot be converted into cash easily, then higher current ratios may not indicate the true capability of the enterprises to pay their current debts. The basic assumption of quick ratio is that inventory is generally the least liquid current asset and should therefore be ignored. Viewed in this way, quick ratios were considered more relevant than current ratios. The quick ratio is similar to quick net working capital. The quick ratios for selected enterprises are also presented in Table 4.

The majority of the selected enterprises had quick ratios less than one. However, average quick ratios were greater than one for public trading enterprises and manufacturing enterprises in Nepal. The average quick ratio is highest for NSC. The measure of risk is useful when there is a need to indicate how much of current assets have been financed from the long term funds after financing fixed assets. In this process, the degree of risk associated with the liquidity was measured with the liquidity of enterprises (Sharma, 2007). The risk could be measured by using the following formula:

$$Rk = [(\text{Total Equity} + \text{Long Term Liabilities}) - \text{Fixed Assets}] / \text{Current Assets}.$$

It helps to assess the magnitude of the risk return trade-off achieved by enterprises. The varying level of average Rk, CR and QR maintained by the different enterprises has been shown in Table 4. For all the selected enterprises, Rk value was less than QR value and latter was less than CR value except for DDC and ND. The average values for CR, QR and Rk were closely associated with each other. An enterprise is assumed to have followed the aggressive approach when current liabilities are used to finance a portion of fixed assets and conservative when it uses only long term funds to finance all kinds of current and fixed assets. Similarly, it was assumed that public trading enterprises and manufacturing enterprises have followed moderate policy when it used long term funds to finance a portion of current assets.

An aggressive financing policy utilizes higher levels of normally lower short term debt and less long term capital. Although lowering capital costs, this increases the risk of a short liquidity problem. A more conservative policy uses higher cost capital but postpones the principal repayment of debt or avoids it entirely by using equity. The total current liability to total assets ratio was used to measure the degree of aggressive financing policy, with a high ratio being relatively more aggressive (Visscher & Weinraub, 1998). Under an aggressive current asset policy, an enterprise holds relatively large amounts of each type of current assets.

Under a conservative current asset policy, the enterprises holds minimal amounts of these items; using more of long term funds (Pradhan, 2004). The advantage of this measure is to identify the working capital policies followed by different selected enterprises.

**Table 4: Working Capital of Selected Enterprises**

Name of the Enterprises	NWC	QNWC	CR	QR	Rk
<b>Public Trading Enterprises</b>					
AIC	820.45	-391.45	1.21	0.99	-0.22
NSC	-236.37	-616.15	6.73	6.84	-0.41
NTC	-505.59	-4501.36	0.98	0.28	0.80
NFC	540.17	-278.00	1.48	0.31	-0.49
NOC	1319.09	-2502.15	1.40	0.68	-0.20
TCN	5287.12	-15458.77	1.76	0.94	-2.46
Mean	1204.14	-3957.98	2.26	1.67	-0.50
<b>Public Manufacturing Enterprises</b>					
DDC	-444.64	-723.66	0.52	1.05	0.35
HPPC	-20337.73	-20623.36	0.05	-0.04	-0.18
HCI	1378.23	103.55	1.59	1.05	0.04
JCF	-2869.32	-5337.15	0.77	0.44	0.62
ND	-1952.00	-1322.50	0.82	0.98	-0.62
NOMP	-1353.00	-9349.33	0.91	0.11	-2.93
UCI	-107.04	-1435.55	1.20	0.75	0.02
Mean	-3669.36	-5526.86	0.84	0.62	-0.38
Grand Mean	-1420.05	-4802.76	1.50	1.10	-0.44

**Note:** The sample consists of 13 manufacturing and trading enterprises in Nepal for the period between 2000 to 2010. Above Table shows average result of net working capital, quick net working capital, current ratio, quick ratio, and risk.

As per the assumption, if the value of risk is one or close to one, then the enterprise is said to have followed a conservative approach and if the value of risk is zero or less, then the enterprise is said to have followed an aggressive approach. Hence, if the value of risk is more than zero but less than one, it is said to have moderate approach. The positions of working capital approaches followed by selected enterprises are shown in Table 5.



**Table 5: Types of Approaches followed by Selected Enterprises**

<b>Name of the Enterprises</b>	<b>Risk (Rk)</b>	<b>Approaches of Working Capital</b>
<b>Public Trading Enterprises</b>		
AIC	-0.22	Aggressive
NSC	-0.41	Aggressive
NTC	0.80	Conservative
NFC	-0.49	Aggressive
NOC	-0.20	Aggressive
TCN	-2.46	Aggressive
<b>Public Manufacturing Enterprises</b>		
DDC	0.35	Moderate
HPPC	-0.18	Aggressive
HCI	0.04	Moderate
JCF	0.62	Moderate
ND	-0.62	Aggressive
NOMP	-2.93	Aggressive
UCI	0.02	Moderate

## DISCUSSIONS AND CONCLUSIONS

A higher financial liquidity would generally mean a lower risk of technical insolvency showing capability of an enterprise to pay the current debts as they become due. There are several measures with the help of which the short-term liquidity of an enterprise may be assessed. Among them, net working capital itself provides the one which indicates a 'margin of safety' or 'cushion' of protection provided by Nepali enterprises as shown in Table 4. Liquid assets constitute a considerable portion of total assets and have important implications

for the enterprise's risk and profitability (John, 1993). The smaller enterprises have relatively fewer liquidity constraints, but the largest enterprises have no particular liquidity constraints, consistent with their ability to easily access to internal and external sources of funds (Audretsch and Elston, 2002).

The study revealed that most of the public trading enterprises and manufacturing enterprises were following aggressive working capital policy. Out of 13 public enterprises, eight enterprises were selecting aggressive policy. The majority of the public trading enterprises were following aggressive working capital policy as compared to public manufacturing enterprises. It means more current liabilities were used to finance a portion of fixed assets in public trading enterprises in comparison with public manufacturing enterprises. The majority of the enterprises had utilized higher levels of normally lower cost short term debt and less long term capital. Only, NTC was adopting conservative policy and four public manufacturing enterprises had moderate working capital policy.

On the basis of the analysis, it was reflected that the management of working capital depends upon the management of current assets. Out of public manufacturing enterprises, the largest ratio was for JCF and lowest for NOMP. Out of public trading enterprises, NTC had strong position and was followed by NOC, NFC, TCN, NSC, and AIC. On an average, public trading enterprises had invested more amounts in total assets in the form of current assets as compared to public manufacturing enterprises. Both, public trading and manufacturing enterprises had invested more than 50 percent in total assets in the form of current assets. This analysis revealed that public trading enterprises had used more current assets as compared to public manufacturing enterprises. The analysis revealed that public trading enterprises had more current assets in the form of inventories across the years as compared to public manufacturing enterprises. The year-wise average gross working capital ratio had shown the improvement in utilization of gross working capital over a period of time. The analysis indicates that the gross working capital was utilized with varying degrees of efficiency by public trading enterprises and manufacturing enterprises. The analysis also reveals that the utilization of current asset position in public trading enterprises was better as compared to public manufacturing enterprises.

The net working capital ratio fluctuated widely from one year to another without indicating any kind of improvement in net working capital utilization. Among public trading enterprises, the highest turnover was observed for NOC and among manufacturing enterprises, for DDC. The analysis shows that the net working capital utilization was very poor in public manufacturing enterprises as compared to public trading enterprises.

In the analysis of short term financial liquidity position of the selected public enterprises, it is observed that the average net working capital varied widely from one enterprise to another. It is further observed that the average NWC of public trading enterprises was positive whereas average NWC of manufacturing enterprises was negative. The CR and QR of public trading enterprises were found better than CR and QR of public manufacturing enterprises. This means, liquidity position of public trading enterprises was found better in comparison with liquidity position of public manufacturing enterprises.

The majority of the public trading enterprises and manufacturing enterprises had negative margin of safety to creditors from quick assets. In other words, quick assets are insufficient to cover the current liabilities. The majority of the enterprises had current ratio less than standard measure 2:1. Only NSC had current ratio of more than two. It means that Nepali public trading enterprises and manufacturing enterprises were unable to maintain liquidity in appropriate way. In majority of the public trading enterprises and manufacturing enterprises, similarity was found between net working capital and current ratio and between risk and current ratio. The result was not consistent for all the public trading enterprises and manufacturing enterprises. Most of the public trading enterprises and manufacturing enterprises were following aggressive working capital policy. It means the public trading enterprises and manufacturing enterprises were using short term funds to finance a portion of current assets.

In most of the public trading enterprises and manufacturing enterprises, the value of risk was found less than zero i.e. negative value. Only NTC had followed conservative working capital policy. The analysis also shows that the majority of the public trading enterprises were following aggressive working capital policy as compared to public manufacturing enterprises. Only four public manufacturing enterprises had followed moderate working capital policy.

The quick ratios were considered more relevant than current ratios. The majority of the selected enterprises had quick ratios less than one. However, average quick ratios were greater than one for public trading enterprises and manufacturing enterprises in Nepal. The average quick ratio was highest for NSC. The Rk value was less than QR value and latter was less than CR value except for DDC and ND. The average values for CR, QR and Rk were closely associated with each other. The study revealed that most of the public trading enterprises and manufacturing enterprises were following aggressive working capital policy. The majority of the public trading enterprises were following aggressive working capital policy as compared to public manufacturing enterprises. It means more current liabilities were used to finance a portion of fixed assets in public trading enterprises in comparison with public manufacturing enterprises. Only, NTC was adopting conservative policy and four public manufacturing enterprises had moderate working capital policy.

The descriptive statistics has shown the high average cash conversion cycle in Nepali public trading enterprises and manufacturing enterprises. This means public trading enterprises and manufacturing enterprises were unable to manage working capital in effective and efficient way. The delay in payment to suppliers and others were also found high in Nepali public enterprises and trading enterprises. The average sales growth was found low. The majority of the selected public enterprises had CR below its standard value. The mean return on assets was found negative. The highest total debt was found in Nepali public trading enterprises and manufacturing enterprises. NPM and ROA both had found positive relationship with cash conversion cycle. The majority of the public trading enterprises and manufacturing enterprises had shorter age of inventories which indicated the better liquidity of public enterprises. The public trading enterprises and manufacturing enterprises were not collecting the receivables on time. The majority of the public trading enterprises

and manufacturing enterprises had negative net working capital. The liquidity position of public trading enterprises was found better in comparison with liquidity position of public manufacturing enterprises. The majority of the public trading enterprises and manufacturing enterprises were following aggressive working capital policy. The average cash conversion cycle was very high in Nepali public trading enterprises and manufacturing enterprises.

Most of the public trading enterprises and manufacturing enterprises have been following aggressive financing policy, which is quite risky leading to high profitability and low liquidity. The public trading enterprises and manufacturing enterprises had used more short term financing or the entire estimated requirement of current assets was financed through short term sources. Herbert and Visscher (1998) also found that when relatively aggressive working capital assets policies were followed, they were balanced by relatively conservative working capital financial policies. In contrast, theory suggested the high profit in this approach, but Nepali public trading enterprises and manufacturing enterprises are getting low profit, this might be due to short term interest rate and other influences of different confounding variables. This finding is contradicted with Walker (1964) that more conservative management would employ more working capital for a given volume of output. The findings on working capital policy in this study are also in contrast with findings from Raheman and Nasr (2007). This study found that Nepali public trading enterprises and manufacturing enterprises were unable to maintain liquidity in appropriate way. The average collection period was high and average age of inventories varied from one public enterprise to another public enterprise. The majority of the enterprises had utilized higher levels of normally lower cost short term debt and less long term capital. This finding is consistent with the findings of Tewolde (2012). One of the central tenets of this study is that, effective working capital management enables proper management of the enterprise.

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## FINANCIAL STABILITY: AN OVERVIEW

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### ABSTRACT

*The paper highlights the issue of financial stability in the Indian context, prevention of financial crises including banking, securities market with respect to financial stability. The paper also highlights the two most important factors that have occupied the minds of policy makers within the RBI-inflation and interest rates. The paper also examines the need for financial stability.*

**Keywords:** Financial instability, IMF, Inflation, Interest rate, RBI.

### INTRODUCTION

Ensuring financial stability has come to occupy a very important position in the responsibility of a Central Bank. However, a widely accepted definition of 'Financial Stability' is still elusive. On many occasions, financial instability has been explained and financial stability has been explained as its corollary. It was generally accepted that minimizing financial instability was the way to ensure financial stability. The birth of the discipline 'Financial Stability' can be traced to the East Asian crisis during the 1990's. Following the crisis, the IMF introduced the 'Financial Sector Assessment Programme' in 1999 which aimed at assessing the strengths and weaknesses of the financial systems of member countries at regular intervals. IMF also started publishing the 'Global Financial Stability Report', which sought to highlight the undercurrents that could impact the financial stability.

Financial and economic uncertainty, large swings in economic activity, high inflation and excessive volatility in foreign exchange and financial markets were seen as some of the potential factors that could impact financial stability. Further it was generally accepted that instability increases uncertainty, discourages investment, impedes economic growth, and hurts living standards. Any dynamic economy has an inherent measure of volatility

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– more so far developing economies which undergo structural changes. The challenge to regulatory authorities is to minimize volatility without injuring growth, employment and living standards.

## FINANCIAL STABILITY – EXPANDING HORIZON

For two decades in the aftermath of the East Asian crisis, the shenanigans of the financial world were confident that they know the levers that impacted financial stability. The Global Financial Crisis of 2008 bought in a new dimension to financial stability. None of the conventional drivers of the financial instability like investment slowdown, high inflation or declining living standards were noticed. In fact it was acknowledged that the ability of the US financial markets to create innovative instruments to attract and sustain high levels of capital flows as a positive for the stability of financial markets. It was even perceived that a wider dispersion of credit risks was a measure of de-risking for the financial sector. However, the crisis that unfolded underlined the need to look at a new set of parameters that could signal potential instability. Capital and liquidity reserve requirements, foreign exchange intervention, explicitly limiting leverages are some of the tools that have come back in the arsenal of the central banks of even developed economies.

## REVIEW OF LITERATURE

Rakesh Mohan focusing on growth with financial stability and his unique perspectives from government, the central bank, and academia has shed fresh light on the challenges of economic and financial liberalization. His book, *Growth with Financial Stability* (2011), provides a rare insider view of the development and working of central banking and the financial sector in India. Using a rigorous analytical approach, the book unravels the key to India's macroeconomics and financial stability and provides fresh insights on lessons for the future.

Douglas W. Arner analyze how financial crises have become an all too common occurrence over the past twenty years, largely as a result of changes in finance brought about by increasing internationalization and integration. As domestic financial systems and economies have become more interlinked, weaknesses can significantly impact not only individual economies but also markets, financial intermediaries, and economies around the world. This volume addresses the twin objectives of financial development in the context of financial stability and the role of law in supporting both. Financial stability (frequently seen as the avoidance of financial crisis) has become an objective of both the international financial architecture and individual economies and central banks. At the same time, financial development is now seen to play an important role in economic growth. In both financial stability and financial development, law and related institutions have a central role.

1. Comprehensive analysis of the role of law in financial development and stability.
2. Analysis of the role of the international finance architecture in financial stability and financial development.
3. International and comparative perspective by a financial sector development reform specialist.

## FINANCIAL STABILITY IN THE INDIAN CONTEXT

The concept of financial stability in the Indian context was a direct outcome of the global financial crisis. The Financial Stability Unit (FSU) was announced by the RBI in the Annual Policy Statement of April 2009 to perform the following function:

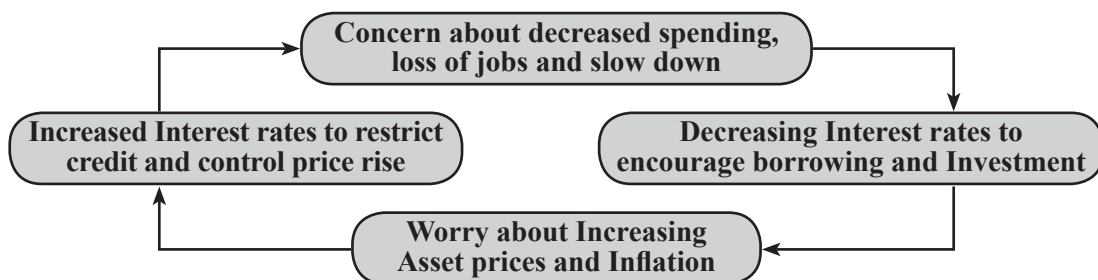
1. Conduct of macro-prudential surveillance of the financial system on an on basis;
2. Preparation of financial stability reports;
3. Development of a database of key variables which could impact financial stability, in co-ordination with the supervisory wings of the Reserve Bank;
4. Development of a time series of a core set of financial indicators;
5. Conduct of systemic stress tests to assess resilience;
6. Development of model for assessing financial stability in due course.

Consequent to the formation of FSU, RBI started publishing the *Financial Stability Report*, the first edition of which was published in May 2010. As opposed to the concept of limiting the monetary policy measures to the single agenda of 'inflation targeting', RBI's stated position has been to focus on price stability, growth and financial stability. This coupled with a strong regulatory oversight, both on banks and the financial markets, has helped RBI achieve the objective of financial stability.

However, interest rates and inflation have come to become the two most important factors that have occupied RBI's mind space. For a country which has witnessed spiraling interest rates and persistent double digit inflation, it is natural for the monetary policy to focus on interest rates and inflation.

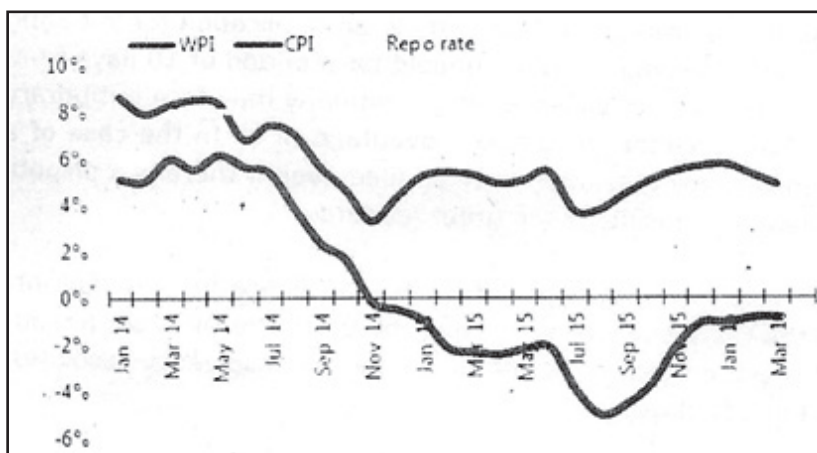
## INFLATION AND INTEREST RATES

However, with the economy undergoing structural changes, the relationship between interest rates and inflation also appears to be getting complex. With services being the engine of economic growth, capex is no more an indicator of growth. Similarly, a large part of the informal sector which used to be a cash economy was not impacted by interest rate movements. Further, supply side dynamics were also playing a significant role in price-rise and inflation, where monetary tools were not effective. A look at the comparison of interest rates and inflation over a two year period (Figure 2) shows that there are factors other than interest rates that have a bearing on inflation.



**Figure 1: Determining Factors for Interest Rate and Inflation**

The banking sector is an important component of the financial stability scene. A very significant part of the financial system is dependent on the banking system and it is essential that banking sector is well governed and regulated to ensure the stability of the financial system. To this end the RBI has been proactive in addressing the concerns of the banks, through an effective supervisor role. Two important developments that are likely to have a significant impact on the Banking systems are the (1) Insolvency and Bankruptcy code and the (2) Scheme for Sustainable structuring of Stressed Assets (S4A).



**Figure 2: Comparison between Inflation and Interest Rate( 2- Year graph)**

**Insolvency and Bankruptcy Code:** The much awaited law codifying the Insolvency and Bankruptcy processes was enacted on May 28, 2016. The Law establishes the process for resolution in the event of a debtor not being able to pay the dues and subsequent liquidation in the event of inability of the parties to arrive at a resolution. Closure of business and honorable exit by all the parties have been vexed issue in the Indian corporate landscape with a host of legislations and a multitude of regulators governing the process. The new Law seeks to act as a ‘one stop shop’ for the process of liquidation. The enactment is seen as a step towards ‘Ease of Doing Business’.

The Law has all the right ingredients for speedy measures in the event of inability of a business to pay its creditors:

1. Separate processes for corporate entities and partnership and proprietorship firms.
2. Separate Adjudicating Authorities for Corporate (National Company Law Tribunal, NCLT) and partnerships and individuals (Debt Recovery Tribunal, DRT).
3. An independent Insolvency Resolution Professional to manage the process of resolution.
4. Independent information utilities to provide the necessary unbiased financial information.

5. A defined timeframe for resolution and in the event of inability to resolve, automatic liquidation.
6. A change in the hierarchy of payments in the event of liquidation. From a situation where the government dues are to be paid first in the event of liquidation under the current laws (wherein almost all liquidation cases, as also the liquidation proceeds are exhausted once the Government dues are paid up) to a situation where the Government stands for the satisfaction of other creditors.

The Law seeks to protect the interests of both the Financial Creditor - one who has provided with funds for the business and an Operational creditor – who has sold goods or services in the ordinary course of business. Employees are also considered as operational creditors to the extent of their unpaid dues.

**Potential Pitfalls:** While the intent of enacting such a Law is honorable, some of the specific provisions have the potential to disrupt the business even in the face of a short term liquidity crunch. It appears that an unwitting business entity may end up being unnecessarily drawn into the process of insolvency resolution. Any operating creditor can file an application for initiating a corporate insolvency resolution process if his dues remain unpaid for a period of 10 days from the date of demand. There could be numerous occasions where a company may face temporary cash flow problems and an unscrupulous creditor could take advantage of it. In the case of a financial creditor, an application for insolvency resolution may be filed even if there is a dispute regarding the financial debt. This could land businesses in great jeopardy.

The adjudicating authorities are the NCLT and the DRTs. While the NCLTs are just coming into being and will take over the work of the Company Law Board and the BIFR, the DRTs are already overworked. Given the workload of these entities it is not clear how the insolvency resolution process is expected to be completed in 180 days.

The law appears to be on sound footing when it comes to liquidation – when the resolution process fails or when the company comes into voluntary liquidation. The change in the hierarchy and allowing secured creditors to exercise their right is a move in the right direction to bring confidence to lenders. However, only time will tell the efficacy of this law to achieve resolution in the event of non-payment of dues.

**Scheme for Sustainable structuring of Stressed Assets (S4A):** The scheme for Sustainable structuring of Stressed Assets (S4A) is yet another tool to tackle the growing challenge of stressed assets in the banking sector. The earlier schemes like 5:25 and SDR have not had the desired effect and this is an improvisation over those initiatives. S4A envisages the determination of a sustainable debt level for the borrower. The outstanding debt is sought to be divided into sustainable debt and equity/quasi-equity instruments. The equity component is expected to provide a potential upside to lenders. It seeks to cover projects that have started commercial operations and have outstanding loan of Rs. 500 crore (reduced to Rs. 250 crore subsequently). The transparency of the resolution process is ensured by way of appointment of an external agency for technical evaluation and also oversight of an independent committee comprising experts.



The scheme provides an opportunity to lenders to deal with stressed assets that have the potential to be received. Entities facing genuine difficulties on account of external factors which are beyond their control have an avenue to rework their financial structure and turn viable.

## CONCLUSION

With hardening interest rates and the imminent increase in cost of funds, the credit growth is expected to slow down, which could adversely affect the profitability. The bank's profitability has recently improved, buoyed by increased Net Interest Income (NII) though non-interest income remained stagnant. An increase in NII facilitated growth of around 20% in aggregate net profit of the banking system, even with an almost stagnant non-interest income and increase in risk provisions. Banks may face extreme liquidity constraints, under severe stress scenario.

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# TRENDS AND PATTERNS OF EMPLOYMENT IN TECHNOLOGY- INTENSIVE INDIAN MANUFACTURING:AN INDUSTRY-WISE EXPLORATION

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*Satyasheel Dhanle\*\**

## ABSTRACT

*The paper explores employment trends and patterns differently based on the industry's technological classifications. This research suggests that a high-technology-intensive industry increases employment growth rates. Similarly, low-technology-intensive and medium workers gap have widened after the trade liberalization. It is found that major industry groups have witnessed slightly increasing employment growth during the 1989-1990 to 1999-2000. Then declined during the period 2000-01 to 2005-06. This study examines shifts in employment generation potential of different sectors of manufacturing industry.*

**Keywords:** Elasticity, Employment Growth, High-Medium-Low-Tech; skill-intensive, trade liberalization, Value Added.

## INTRODUCTION

In the recent decades, technology is known to substitute the workers. Skill based technology in labour-scarce country increases demand for skilled workers (Acemoglu, 2002; Berman, Bound and Machin, 1998; Berman and Machin, 2000). The skilled based technological change and trade liberalisation is by-product of the process of globalization. In the recent decades, export-led growth has become a dominant factor in employment growth in high technology-intensive industries, whereas import penetration adversely affect the employment growth in low technology-industries (Gera and Masse, 1996). In the Indian context, technological change in manufacturing sector has been skill-based since trade liberalisation policies were

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introduced. This has precipitated increased demand for skilled workers (Uma and Rani, 2005; Banga, 2005 and Pradhan; 2006).

There exists a huge literature on trade liberalisation and employment growth mainly in Indian organised manufacturing. There are only few studies which have systematically analysed the technology- intensive industries and the unorganised Indian manufacturing sector. The paper tries to fill this gap by analysing the technological classification and both organised and unorganised Indian manufacturing. However, present study is more detailed in terms of the level of aggregation of industries and also in the coverage of time period as it is extended to recent years. The coverage of a longer time span in the post 1990s period helps for a better assessment to understand the trends and patterns of various types of labour composition.

## **RESEARCH METHODOLOGY, DATA OVERVIEW AND ISSUES**

This study seeks to contribute to the contemporary policy discussion about factors constraining India's manufacturing employment performance in order to make industry- level policy suggestions. It presents the trends and patterns of India's employment dynamics since 1990s against the backdrop of the growing 'jobless' employment growth. The focus is on the changing performance of manufacturing employment at the NIC-1998 at 3-digit level.

For this analysis, the various datasets are used such as: Annual Survey of Industries (ASI), National Sample Survey Organization (NSSO) by Central Statistical Office. The comprehensive data of ASI provides classification at different digits which provides detailed specifications of industries. This study used 55 industries at 3-digit level groups, covering the period from 1989-90 to 2005-06.

The data collection of organised manufacturing sector is covered under the Central Rules 1959, framed under the 1953 Act provided for comprehensive data by ASI. The organized manufacturing sector data is abstracted from the ASI, undertaken by the CSO, which is an annual census-cum-sample survey of all the organized manufacturing units for all the industries across all the states. It covers all factories under sections 2m (i) and 2m (ii) of the factories act, 1948. It collects data from those factories employing 10 or more workers, using the power and those employing 20 or more workers without using power.

The unit-level data for the unorganised manufacturing sector is obtained from the quinquennial surveys conducted by NSSO, Central Statistical Organisation (CSO) for 1994-1995 (51<sup>st</sup> round), 2000-2001 (56<sup>th</sup> round) and 2005-2006 (62<sup>nd</sup> round). Data of available rounds of ASI and NSSO have been used at different NICs. The present study confines the mapping of industrial classifications into the NIC-1998 at 3 digit level. Technology-based classification of industries is followed as per the Organisation for Economic Cooperation and Development to identify technological-intensive industries in Indian manufacturing (OECD, 2007).

## **TECHNOLOGY-INTENSIVE INDUSTRIES**

This study deals with employment growth rates and its share in technology-intensive industries for the period 1989-1990 to 2005-06. We depict the data of 55 three-digit industries, reclassified into three technology-intensive subgroup namely, High-Tech (HT), Medium-Tech

(MT) and Low-Tech (LT) in Indian manufacturing. This exercise is done according to the technology-based classification provided by OECD (2007).

In aggregate Indian manufacturing data, the MT-intensive industries have registered highest growth in value added during 2001-06 (Table 1.1). Whereas, the HT and LT-intensive industries had a satisfactory growth rate registered in value added during the same period. By contrast, The HT-intensive industries have registered highest employment growth rate during the same period. While, MT industries have registered 3.08 per cent and LT industries registered its negative growth rate (Table 1.1).

The changing trends and patterns of employment in Indian organised manufacturing respective to 55 industries and technology-intensive sub-group for the different periods 1989-90 to 2005-06 in NIC-98 at 3-digit group is presented in Table 2. In the initial period of liberalisation during early 1990s, value added in the organised manufacturing grew at 8.36 per cent, with growth of employment at 2 per cent (Table 1.2).

In the unorganised manufacturing, the manufacturing value added has registered a negative growth rate (-1.94 per cent) and employment also registered negative growth rate (-2.39) during the 1989-1990. The HT industries have registered higher growth rate in value added, whereas the HT industries had registered highest growth rate in employment. As in the organised manufacturing, this fastest growing sector (HT, LT and MT) industry is value added. Some analysts have argued that the reason for high growth rate in these value added industries has been caused by the high effective rates of protection that these industries enjoyed. It has been compared with organised manufacturing to unorganised manufacturing, that had a negative growth rate in value addition (Uma and Rani, 2004).

Despite, the high growth rate of value addition, employment grew very slowly in the organised manufacturing and in the context of unorganised manufacturing there is a declining growth rate. The slow growth rates in employment in the organised manufacturing have been termed as the period of 'jobless' growth (Nagaraj, 2000). In the organised manufacturing, employment growth was comparatively higher in HT industries in comparison with others. By contrast, in the unorganised manufacturing; employment in the LT industries had a negative growth rate while MT industries shows positive growth rate. The employment elasticity for Indian manufacturing was (-0.09) during 1989-95 and it slightly increased during the period of 1995-2001 (Table 1.1) and declined again (0.13) during 2001-2006. The low absorption of labour in the Indian manufacturing, some have argued, is due to inappropriate technological choices and product composition.

In the period of 1994-95 to 2005-06, the growth of value added is almost stagnant. At the same time, growth rates of employment have decreased by two times over the last two periods of 2000-01 to 2005-06. Table 1.2 documents the growth rates of value added and employment for each sector. These growth rates of value added reveal the similar cyclical pattern over the period of time. The HT industries expanded rapidly during the early 1990s when the India economy witnessed the early globalisation. It shows that HT industries grew faster (3.85 to 6.19 per cent) than the MT industries (3.52 to 3.08 per cent) over the period of 1994-95 to 2005-06.

At the same time, aggregate employment growth rate decreased from 2.9 per cent to 1.2 per cent during the same period of time. The performance of employment patterns in the LT has slightly decreased whereas the HT and MT industries had increased growth rates and other industries registered almost negative growth rates in Indian manufacturing. Therefore, the evidence does not suggest any clear trend in the employment elasticity in Indian manufacturing. In the case of HT and MT industries, the employment elasticity has though increased (Table 1.1).

Table 1.2 shows that across the industry groups, leather (16.5 per cent), footwear products (12 per cent) and chemical products (7.4 per cent) had a high growth rates in value addition. Further, growth rate was observed higher for petroleum products and fuel, non-ferrous metal, general purpose machinery, special purpose machinery and TV, radio, video and tubes during the same period of time. Undoubtedly, during this period consumer goods industry dominated the manufacturing sector. In this connection, metal based and machinery industries had a comparatively better growth rates than the earlier periods in the Indian organised manufacturing.

**Table 1.1: Aggregate Growth Rates and Employment Elasticity of Indian Manufacturing**

Industry Group	Growth Rates Value Added (CAGR)		
	1989-95	1995-2001	2001-2006
High Tech	7.34	8.68	8.03
Low Tech	3.57	5.77	8.32
Medium Tech	7.59	8.09	12.60
<b>Total Manufacturing</b>	<b>5.81</b>	<b>7.41</b>	<b>9.47</b>
Growth Rates Employment (CAGR)			
High Tech	-0.65	3.85	6.19
Low Tech	-1.98	2.65	-3.38
Medium Tech	-0.08	3.52	3.08
<b>Total Manufacturing</b>	<b>-1.57</b>	<b>2.90</b>	<b>1.24</b>
Employment Elasticity			
High Tech	-0.09	0.44	0.77
Low Tech	-0.55	0.46	-0.41
Medium Tech	-0.01	0.44	0.24
<b>Total Manufacturing</b>	<b>-0.27</b>	<b>0.39</b>	<b>0.13</b>

**Source:** Calculated by Author from Unit-Level NSS rounds, Annual Survey of Industries

**Note:** \*The employment elasticity is estimated by dividing the rate of growth of employment by the rate of growth value added.

Similarly, In case of employment across the industry groups of knitted and crocheted, leather products, refined petroleum and chemical industries; employment growth rates were higher among the HT-industries. Likewise, employment growth has been registered higher in TV, radio, video, machinery, optical instruments, and photography equipment after economic reforms.

Further, HT and MT industries are performing well with regards to employment growth in Indian organised manufacturing. Table 1.2 indicates that across the manufacturing industries HT industries has registered rapidly rising employment growth rates over the period 1989-90 and 2005-06 compared to the MT and LT industrial groups. In the early 1990s, across the manufacturing sectors, LT industries have registered negative employment growth; after that it has increased slightly over the second period and again decreased in the third phase of this study. The rate of employment growth in Indian manufacturing has marginally slowed down from 2.9 per cent in 1994-2001 to 1.2 per cent in 2005-06. This slowing down trend in employment generation has led to a general concern in India about the impact of trade liberalisation on employment.

### **HOLISTIC PICTURE OF EMPLOYMENT IN MANUFACTURING INDUSTRIES**

We estimate the employment growth rates and share of employment in total Indian manufacturing (Table 1.3). Some important results emerge in HT industries. Trend of employment growth rates is as follow: -0.65 per cent in 1990s and around 6.40 per cent in early 2000s. Thus higher growth rates were registered during the last decade compared to previous decades. Across the HT industries which saw a drastic fall in the employment trend; growth rate in man-made fibres, watches and clocks, aircraft and spacecraft, TV and radio transmitters, TV and radio receivers and bodies for motor vehicle; there was sharp decline. This sharp fall can be attributed to the lack of investment in R&D in the wake of a high competitive environment of 1990s (Mehta, 2011).

Similarly, in case of employment across the industry groups of knitted and crocheted, leather products, refined petroleum and chemical industries employment growth rates are higher among the HT-industries. Likewise, employment growth has been registered higher in TV, radio, video, machinery, optical instruments-photograph equipment after economic reforms. Further, HT and MT industries performed well with regard to employment growth in Indian organised manufacturing. Table 1.2 indicates that across the manufacturing industries HT industries registered rapidly rising employment growth rates over the period 1989-90 and 2005-06 compared to the MT and LT industrial groups. In the early 1990s, across the manufacturing sectors, LT industries registered negative employment growth. After that it has increased slightly over the second period and again decreased in the third phase of this study. The rate of employment growth in Indian manufacturing has marginally slowed down from 2.9 per cent in 1994-01 to 1.2 per cent in 2005-06. This slowdown trend in employment generation led to a general concern in India about the impact of trade liberalisation on employment.

However, among HT industries, only few industries have shown an increasing trend of employment growth rates in the post-reform era. These are the office, accounting and computer machinery, medical appliances, general purpose machinery, electronics motors, etc,



Table 1.2 :Growth Rates in Employment and Value Added of Indian Manufacturing by NIC-1998 at 3-Digit

Industry Group	Organised Manufacturing			Unorganised Manufacturing			Organised Manufacturing			Unorganised Manufacturing		
	Value Added(CAGR)			Value added(CAGR)			Employment(CAGR)			Employment(CAGR)		
	1989-95	1995-01	2001-06	1989-95	1995-01	2001-06	1989-95	1995-01	2001-06	1989-95	1995-01	2001-06
<b>High Tech (HT)</b>												
242	7.90	13.29	7.41	-21.23	10.57	12.82	3.17	5.85	1.89	-12.94	11.40	3.70
291	5.05	15.51	14.20	-20.94	31.70	5.28	1.53	12.61	0.78	-11.67	29.94	27.02
292	5.05	-1.05	13.66	-1.60	9.08	9.21	0.36	-8.75	-0.03	0.88	4.71	6.21
321	7.51	25.81	12.00	-4.91	18.45	-2.12	8.02	4.97	7.29	4.91	11.78	7.47
322	5.37	-0.90	5.46	-38.30	62.73	0.09	4.02	-12.34	-3.87	-26.38	34.06	2.41
323	21.71	-1.66	1.77	5.98	-7.29	14.01	-1.95	0.45	-6.14	1.82	-8.96	0.73
332	24.88	15.89	4.56	27.75	-13.09	1.57	51.26	7.30	3.08	7.99	-11.95	13.24
241	12.25	10.22	7.56	-20.87	11.03	-1.51	3.36	1.31	-4.10	10.55	-6.85	27.78
243	2.40	-0.34	-14.32	-30.76	15.10	24.46	10.77	-5.31	0.09	-31.74	4.88	59.50
300	10.67	-12.29	34.03	19.91	-63.76	-0.94	-1.57	-6.12	4.21	5.91	-36.92	17.00
319	4.61	18.79	19.96	19.70	53.86	19.44	-5.92	12.76	9.01	10.58	48.53	5.04
331	13.95	15.34	16.96	-25.31	12.53	-4.74	5.39	4.54	3.17	-15.03	12.70	22.42
333	0.76	-0.18	23.34	14.84	-29.95	-36.48	-0.93	0.01	-7.78	4.29	-31.48	4.59
351	15.48	3.85	16.94	-27.13	38.47	10.82	-0.21	-0.70	-2.59	-36.06	27.75	14.88
353	14.13	20.51	-17.41	80.86	18.97	19.35	4.67	-8.57	-10.19	-34.43	23.64	3.57
293	13.39	17.91	-1.26	-31.57	10.46	2.42	4.65	10.02	-5.67	-14.98	8.18	5.83
311	9.63	1.36	6.42	-22.75	17.30	4.56	3.75	-3.52	2.08	-13.14	22.06	23.45
313	13.09	7.54	-5.00	-6.16	4.44	8.38	0.95	2.90	-2.91	-15.12	7.79	33.37

314	4.75	12.41	6.16	4.14	11.75	0.51	3.32	2.95	1.88	6.34	6.37	4.09
315	8.97	12.48	-2.55	-24.53	13.14	-12.08	1.77	-1.81	3.71	-5.14	8.20	17.07
341	11.31	11.74	8.78	-6.24	-57.07	-1.01	1.28	-4.77	0.72	-9.91	-53.99	25.48
342	6.83	-47.25	5.95	-14.05	18.04	-3.48	5.80	-28.05	-4.36	3.98	11.38	4.22
343	12.14	61.15	2.05	21.59	28.78	-1.28	3.61	47.12	6.90	11.62	19.36	10.08
352	-8.10	-13.65	13.70	-17.68	1.12	0.65	2.72	-34.98	-5.70	-24.48	7.22	3.60
359	16.76	9.15	4.68	-0.97	1.32	0.82	1.33	3.24	3.89	-4.55	-2.89	18.42
<b>Total HT</b>	<b>8.87</b>	<b>8.39</b>	<b>8.01</b>	<b>-11.73</b>	<b>14.04</b>	<b>8.49</b>	<b>2.51</b>	<b>0.48</b>	<b>1.12</b>	<b>-6.36</b>	<b>9.86</b>	<b>11.70</b>
<b>Low Tech (LT)</b>												
173	10.34	16.30	-1.41	5.11	4.30	8.90	10.73	4.65	20.46	-17.52	7.63	-0.79
191	6.77	-1.17	16.56	11.95	11.01	2.03	0.32	-5.01	7.93	4.99	3.06	9.96
192	15.61	10.79	12.04	7.42	-0.96	1.03	7.15	6.06	6.71	-3.20	-5.28	-8.88
151	9.84	1.73	13.04	4.22	5.20	2.58	2.19	0.32	2.36	-3.02	9.84	-6.14
152	-5.16	13.84	18.75	7.90	7.46	-2.18	4.62	2.68	0.74	8.75	6.11	-19.27
153	13.04	6.95	13.16	-3.97	9.98	-3.49	2.12	4.88	1.49	-2.64	6.49	-8.70
154	3.83	2.42	11.95	-1.68	14.50	5.95	-0.90	7.80	-0.84	0.90	1.08	-1.21
155	8.51	14.07	10.15	-3.31	17.12	5.19	3.43	2.08	6.29	9.34	3.61	-15.79
160	7.18	7.72	17.50	-4.30	6.04	9.23	2.10	-1.86	0.05	-8.80	9.27	-37.53
171	6.02	1.47	6.34	-5.67	5.17	-12.53	-0.82	-0.63	-1.93	-4.93	-0.74	-21.03
172	8.90	16.86	17.51	3.21	12.15	8.98	2.79	11.87	8.96	1.42	0.21	-15.28
181	27.00	2.29	14.13	6.18	17.84	-9.03	17.35	3.77	12.12	0.67	18.22	20.98
182	21.95	-14.39	5.78	7.94	28.30	-7.38	12.67	-2.59	-1.12	2.24	-2.65	1.29
201	-12.12	4.58	-11.58	7.29	-9.46	1.39	-2.59	-27.04	15.43	4.99	-4.04	2.41
202	-1.86	-4.15	25.54	-10.62	4.15	0.75	0.75	-2.96	3.02	-4.34	3.21	6.03

210	3.56	-0.88	15.99	-3.95	13.09	12.31	3.57	1.75	0.22	-1.13	6.87	3.05
221	10.85	3.19	16.49	-6.04	7.16	1.36	2.66	-6.43	3.28	-2.16	4.79	3.82
361	30.00	16.65	9.31	1.41	5.68	7.91	4.73	6.87	5.08	-7.46	-4.79	2.11
369	20.61	20.24	11.52	7.05	6.09	4.03	9.65	10.60	8.33	5.42	-3.92	-8.51
Total LT	7.50	4.56	11.90	-1.64	7.65	1.71	1.77	1.84	2.33	-2.51	2.78	-4.41
Medium Tech (MT)												
232	8.96	-1.44	-0.60	-5.10	-11.04	1.50	6.97	3.59	4.43	-1.57	-25.59	-1.30
231	12.35	-1.07	14.08	-9.99	6.43	14.91	4.03	-4.55	1.74	-12.97	7.23	7.47
272	5.53	13.92	13.79	-2.08	11.14	12.63	-8.75	16.49	-1.49	13.20	2.08	9.28
251	10.49	6.89	2.11	3.87	-8.53	1.75	4.02	2.56	-1.79	6.02	-1.22	12.04
252	9.57	14.42	11.80	5.56	4.78	4.20	6.80	6.71	6.68	5.55	3.69	9.20
261	-0.30	7.79	10.69	-15.93	10.40	2.15	-1.09	-1.21	1.73	-16.15	0.83	-1.92
269	4.97	12.34	10.39	2.59	16.34	4.71	0.65	0.50	5.37	-1.03	3.30	2.74
271	11.82	5.17	19.83	-6.53	0.30	0.57	1.58	-1.02	0.02	-12.83	-0.36	8.35
273	3.28	9.81	13.41	-17.50	17.28	5.83	-0.46	0.40	3.18	-6.15	0.77	22.36
281	12.32	24.17	20.94	5.01	28.90	1.95	3.43	14.01	4.15	2.07	25.39	6.53
289	5.72	5.15	14.61	3.98	4.91	6.59	1.65	-0.78	6.65	0.39	2.12	-1.82
Total MT	8.61	7.41	13.86	2.40	11.72	5.11	1.46	1.70	3.17	-0.63	4.16	3.05
Total Man-ufacturing	8.36	6.98	10.92	-1.94	9.00	3.21	1.92	1.42	2.18	-2.39	3.28	1.01

Source: Calculated by author from various rounds NSS (unit-level) and Annual Survey of Industries

\*Bold print indicates organised/unorganised manufacturing industries at aggregate level

electronic lamps, etc and transport equipment etc. Within the HT industries, remaining other industries have stagnant trends towards employment growth rates. Higher skill premia among the HT industries are more strongly associated with R&D and training rather than with exports (Berman *et al.* 1998). To narrow this gap, skilled labour must be reallocated from production to imitation (R&D, reverse engineering). This shift towards HT-intensive (more skill-intensive) activities raises the relative earning of skill labour but only temporarily (Connor and Lunati, 1999). Trade liberalisation would significantly raise R&D expenditure, and growth rates of those industries would fall since R&D remains a relatively unimportant activity.

Within the subgroup of MT industries, a steep fall is seen in the trend of employment growth rate of basic and non-ferrous metal, glass and glass products and fabricated metal, etc. There are, though, few industries which have shown increased trends of employment growth rates in the post-reform era. These are refined petroleum products, coke-oven products, plastic products, basic iron ore and steel, casting of metals and structural metal, etc. By contrast, only industrial subgroup of MT industries which witnessed an overall rise in the employment growth in post trade liberalisation. This was basically due to the rise in trend in growth of core industry like basic iron-ore and steel. India is fourth largest producer of these products in the world (Mehta, 2011).

The lowest employment growth position was registered under the subgroup of technology-intensive industries namely, LT-intensive industries. Across these industries only few industries have raised employment growth like wearing apparel, wood, cork and straw, publishing and furnishing. Remaining other industries have seen fall in the employment growth rates. Thus, the analysis shows that amongst three subgroup of technology-intensive industry, HT and MT industries registered rise in employment growth whereas LT industries registered 'jobless' growth in the Indian manufacturing in the post-reform period. At the LT industries level, significant slowdown occurred only after the adoption of the structural adjustment programme.

**Table 1.3 Aggregate Industry-wise Employment Compound Annual Growth Rates and Shares (at NIC-1990, 3-Digit)**

NIC-1998 3-Digit Group	Industries Description	Trends Growth Rates			Employment Share			
		1989 to 1995	1995 to 2001	2001 to 2006	1989 to 1990	1994 to 1995	2000 to 2001	2005 to 2006
High-Tech (HT)								
242	Other Chemical Products	-5.30	8.41	2.80	2.41	2.00	2.64	3.71
241	Basic Chemicals	4.47	0.08	3.96	0.59	0.80	0.69	1.03
243	Man-made fibres	9.55	5.19	4.73	0.06	0.10	0.07	0.10
300	Office, accounting and computing machinery	-0.22	9.71	17.70	0.08	0.09	0.05	0.14

319	Other electrical equipment n.e.c.	-0.30	5.83	5.80	0.05	0.06	0.29	0.48
331	Medical appliances	-1.12	6.61	10.95	0.12	0.13	0.15	0.32
333	Watches & Clocks	0.83	-6.88	-6.02	0.08	0.09	0.05	0.05
351	Building and repair of ships & boats	-5.70	2.93	2.73	0.10	0.08	0.08	0.12
353	Aircraft and spacecraft	3.81	-8.00	-9.51	0.02	0.03	0.02	0.01
291	General purpose machinery	-1.89	17.47	14.73	0.40	0.40	0.83	2.11
292	Special purpose machinery	0.59	-1.76	3.95	1.50	1.67	1.32	1.97
321	Electronic valves and tubes	7.35	6.55	7.34	0.07	0.11	0.14	0.24
322	TV and Radio Transmitters	1.46	-6.35	-1.86	0.16	0.18	0.12	0.13
323	TV and Radio Receivers	-0.73	-2.33	-4.21	0.16	0.17	0.13	0.13
332	Optical instruments	10.96	-7.45	10.46	0.04	0.07	0.04	0.08
293	Domestic appliances	-7.84	9.08	0.86	0.21	0.15	0.21	0.27
311	Electronic motors, generators, transformers and distribution & control apparatus	-0.03	3.31	13.45	0.52	0.56	0.57	1.36
313	Insulated wire and cable	-2.44	3.71	10.35	0.13	0.13	0.13	0.27
314	Accumulators, cells and batteries	4.95	4.93	9.76	0.07	0.10	0.11	0.22
315	Electric lamps and lighting equipment	-1.27	2.79	11.76	0.12	0.12	0.12	0.27
341	Motor vehicles	-0.44	-7.09	1.27	0.32	0.34	0.20	0.26

342	Bodies for motor vehicle, coach work	5.52	-14.96	0.87	0.26	0.37	0.15	0.19
343	Parts for Vehicles	8.15	4.73	7.86	0.08	0.13	0.62	1.11
352	Railway and tramways, etc	2.08	3.42	3.96	0.39	0.47	0.08	0.11
359	Transport equipment n.e.c.	-1.05	1.19	9.48	0.46	0.47	0.44	0.85
<b>Total of HT</b>		<b>-0.65</b>	<b>3.85</b>	<b>6.40</b>	<b>8.42</b>	<b>8.82</b>	<b>9.25</b>	<b>15.55</b>
<b>Medium-Technology (MT)</b>								
232	Refined Petroleum Products	5.22	0.77	9.66	0.09	0.13	0.11	0.22
231	Coke-oven products	-2.37	-0.48	4.31	0.15	0.14	0.12	0.18
272	Basic precious and non-ferrous metals	3.14	8.01	4.61	0.26	0.33	0.43	0.66
251	Rubber products	4.80	1.12	4.31	0.40	0.54	0.50	0.75
252	Plastic products	5.94	4.70	8.35	0.62	0.90	0.99	1.83
261	Glass and Glass Products	-11.40	0.04	-0.47	0.62	0.38	0.33	0.39
269	Non-metallic mineral products	-0.81	2.95	3.07	7.94	8.25	8.27	11.77
271	Basic iron and steel	0.46	-0.98	3.94	1.23	1.36	1.12	1.66
273	Casting of metals	-1.37	0.45	7.36	0.36	0.37	0.32	0.57
281	Structural Metal Products	2.44	2.77	6.12	0.44	0.54	1.45	2.41
289	Other Fabricated metal products	0.57	1.70	-0.44	2.99	3.32	3.13	3.74
<b>Total of MT</b>		<b>-0.08</b>	<b>3.52</b>	<b>3.34</b>	<b>15.09</b>	<b>16.26</b>	<b>16.76</b>	<b>24.20</b>
<b>Low-Technology (LT)</b>								
173	Knitted and crocheted fabrics	-11.51	6.66	8.45	0.68	0.41	0.50	0.92
191	Leather	3.29	0.69	9.47	0.34	0.43	0.38	0.75



192	Footwear	-2.02	-3.23	-4.16	1.24	1.22	0.90	0.89
151	Production and process of meat	-1.81	7.80	-4.35	1.73	1.71	2.18	2.14
152	Dairy Products	7.88	5.49	-14.17	0.69	1.11	1.26	0.76
153	Grain mill products	-2.22	6.34	-7.55	7.43	7.19	8.53	7.15
154	Other food products	0.38	3.22	-1.07	4.45	4.90	4.98	5.76
155	Beverages	8.38	3.40	-11.01	0.79	1.29	1.33	0.93
160	Tobacco products	-7.09	7.54	-27.21	9.96	7.56	9.53	2.99
171	Spinning, Weaving, Finishing of Textiles	-4.00	-0.72	-14.40	15.37	13.61	11.36	6.75
172	Other Textiles	1.44	0.49	-13.84	6.27	7.29	6.46	3.95
181	Wearing apparel except fur	5.13	14.21	19.42	1.40	1.96	3.45	11.13
182	Dressing and dyeing of fur	2.97	-2.64	1.09	0.05	0.06	0.05	0.06
201	Saw milling of wood	4.44	-4.88	2.78	0.62	0.84	0.57	0.80
202	Wood, cork and straw	-4.29	3.16	5.16	13.98	12.20	12.36	4.29
210	Paper and paper products	0.96	4.61	1.93	0.85	0.96	1.05	1.41
221	Publishing, Printing, Reprod recorded media	-0.86	2.08	3.72	1.47	1.52	1.46	2.15
361	Furniture	-7.29	-4.49	2.21	3.55	2.66	1.84	2.51
369	Manufacturing n.e.c	5.50	-3.46	-7.39	5.61	7.99	5.81	4.91
<b>Total of LT</b>		<b>-1.98</b>	<b>2.65</b>	<b>-0.03</b>	<b>76.48</b>	<b>74.92</b>	<b>73.99</b>	<b>60.25</b>
<b>Total Manu-factur-ing</b>		<b>-1.57</b>	<b>2.90</b>	<b>1.24</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Source:** Calculated by author from Unit Level NSS rounds and ASI

**Note:** Technology-Based Intensive Classification by OECD.

## CONCLUSION

This paper makes preliminary examination of technological orientation of industries and employment linkages in Indian manufacturing since 1990s. The key questions examined in the study are: what are the employment trends and patterns in Indian manufacturing based on technological classifications? To answer this question, trends in employment in Indian manufacturing sector and major industry groups have been analysed since 1990s. The technological based classification in Indian manufacturing shows that trade openness stimulates the employment growth in high-tech-intensive industries, which contributes around 16 per cent share in total employment. On the other hand, low-tech intensive industries contribute 60 per cent share but has reported almost negative growth rate during the last period of study. The medium-tech industries contribute around 24 per cent and have reported constant growth rates over the last decade in terms of employment.

In the post-reform era, increasing trends of employment growth in high-tech industries is strongly associated with rising R&D expenditure in Indian manufacturing. In the post-reform era India has witnessed the so-called 'jobless growth' where output increased and employment decreased. This study explores further this phenomenon and finds that employment has reported highest growth rates in high technology industries; whereas medium industries have also reported positive but marginal growth rates.

**Table 1.4: Technological Classification of Individual Industries**

Classifications	Industries Codes NIC-1998 at 3-Digit
HT	242+241+243+300+319+331+333+351+353+291+292+321+322+323+ 332+ 293+311+313+314+315+341+342+343+352+359
MT	232+231+272+251+252+261+269+271+273+281+289
LT	173+191+192+151+152+153+154+155+160+171+172+181+182+201+ 202+210+221+361+369

**Source:** Author's Compilation

**Note:** HT = High Tech; MT= Medium Tech and LT = Low Tech.

\* Names of NIC' 1998 codes industries are presented in Table 1.3

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# MGNREGS: SUPPLEMENTING FARM SECTOR

Dr. I. Balu\*

## ABSTRACT

*This study reports on a survey of 1705 users of 1487 assets created under the Mahatma Gandhi National Rural Employment Guarantee Scheme in six states. The study found that 90 percent of asset created, physically exists in field. It provides evidence that MGNREGA assets support agriculture and benefit a large number of small and marginal farmers. An overwhelming 85 percent of the respondents considered the assets as very useful, while only two percent felt they were useless. Overall, this study suggests that the MGNREGA is beneficial for farm sector.*

**Keywords:** Impact of MGNREGA assets, MGNREGA, sustainable development, Uses of assets.

## INTRODUCTION

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was enacted on 7<sup>th</sup> September 2005 with the objective of providing 100 days of guaranteed wage employment in a year to the rural poor so that they can expect to earn a living wage with dignity. The Act envisages, for instance, that the works undertaken will strengthen natural resource management and address causes of chronic poverty such as drought, deforestation, and soil erosion, thereby encouraging sustainable development. MGNREGS is the largest public works employment project in the world. Since last three years (2013-2015) MGNREGS spent Rs. 1, 14,531 crores on public works. It is a direct poverty reduction pathway operated through boosting employment and income for the poor.

The recent intense focus on Mahatma Gandhi NREGA has been on understanding the quality and durability of assets created, to assess the impacts of MGNREGA assets, focusing on environmental services, land and water resources availability (Sudha Narayanan *et al* 2014; Esteves *et al* 2013; Aggarwal *et al* 2012; Dhannjaya *et al* 2011, for example).<sup>1</sup> Such systematic efforts are still relatively infrequent. One explanation for the paucity of studies assessing the impacts of MGNREGA assets has been that it is too early for impacts to be

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visible. However, with ten years of the MGNREGA programme behind us, this constraint is less relevant today. We propose to contribute to the emerging body of evidence by focusing on MGNREGA assets.

The following section outlines the approach and methods used in this study, and it is followed by sections on different aspects of MGNREGA assets from six states and impact of MGNREGA assets on agriculture.

## **THE STUDY: SAMPLING AND METHODS**

This study sought to accomplish three goals. The first was to verify the assets created under the MGNREGA, and to document their condition and quality. This was to address the concern that many of these assets are only on paper. The second was to record the beneficiary perception on uses and impacts for water and land development related assets. The third was to bring out the productivity of the assets created in individual land. This was to record the benefits of farmers through the assets created.

We cover one state from each region and a total of six states were selected based on highest wage expenditure in the financial year 2013-14. The selected states are West Bengal from East, Gujarat from West, Kerala from South, Jammu & Kashmir from North, Madhya Pradesh from Centre and Tripura from North east. In each of states, top two Gram Panchayats (GPs) with highest wage expenditure were automatically selected based on the Management Information System (MIS) data of financial year 2013-14. All the works that were issued completion certificates during 2013-14 were listed from the MIS for a census verification of assets in the selected GPs. The sample GPs accounted for 41.5% community assets and 58.5% individual assets. User's perception is collected from the beneficiaries for the assets related to water and land development. In the case of community assets, two user perceptions were collected from the users of the asset. In the case of individual asset, the user's perception as well as return on investment (RoI) was additionally collected.

Sample households were identified for each MGNREGA assets depending on whether they were on private or public land. For assets on private land, the household of the land owner or of the person who operated the land was considered the beneficiary household, and interviewed (Table 1). The spatial delimitation method was followed to prevent the arbitrary choice of respondents for selection of beneficiary household for community assets. The two households that were selected were such that one is near to the asset and second distant from the asset.

The MGNREGA assets were broadly classified and aggregated into community assets and individual assets for the purpose of survey. Further administrative classifications were considered to capture the types of assets.<sup>2</sup> The survey was conducted from February to May 2015 by 60 trained enumerators drawn from State Institute of Rural Development (SIRD). The survey was conducted in six phases and each region took place in one phase.<sup>3</sup> The survey instruments were translated into Hindi and local language. Three questionnaires were prepared for this study that included issues like instrument on asset verification, user perception and return on investment. Overall, the survey included verification of 1487 assets, 1705 beneficiary households spread across 12 GPs in six states. Of the respondents 41 percent were women.<sup>4</sup>

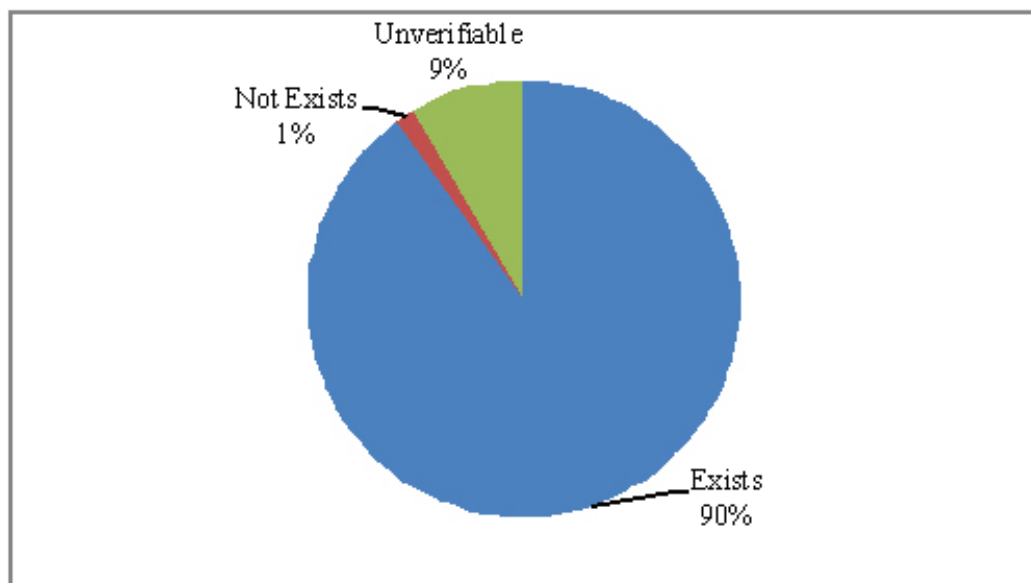
**Table 1: Beneficiaries**

Characteristic	Percent
<b>Social Group</b>	
General Category	17.1
Other Backward Class	37.5
Scheduled Caste	17.6
Scheduled Tribe	9.9
Minorities	17.9
<b>Economic Status</b>	
Above Poverty line	51.3
Below Poverty Line	45.3
Antyodaya Anna Yojana	3.5

**Source:** Primary data collected from field

### EXISTENCE OF ASSETS

The study covered a total of 1487 assets for verification, out of which 90 percent of the assets are physically existing in the field as per MIS and asset register. Out of 1487 assets verified, 23 assets (1.5 percent) did not physically exist in field (Figure 1).



**Source:** Primary data collected from field

**Figure 1: Existence of MGNREGA Assets**



Out of the six states where the assets were verified, two states had assets which were cent percent verified, four states had assets that did not exist (Table 2). Gujarat and Jammu & Kashmir are the states where cent percent assets existed on ground. West Bengal, Madhya Pradesh, Kerala and Tripura are the states where few assets did not exist. In community assets category, 0.2 percent did not exist and in individual assets category 2.5 percent did not exist. It is apparent from the study that greater number of the individual assets did not exist.<sup>5</sup> Following assets did not exist: Drought Proofing (5.6 percent), Water Harvesting (1.6 percent), Irrigation Facility (1.4 percent) and Land Development (0.4 percent). The enumerators were not able to verify 8.5 percent of assets. They were not able to justify the existence of asset. The “Unverifiable” assets existed at some point in time but were damaged or destroyed. This however included assets that were intended to be temporary for example the plants that died due to lack of rainfall and the pond renovation works which could not be verified due to the pond filled with water.

**Table 2: Missing Assets**

State	Total Assets (Nos)	Missing Assets (Nos)	Missing Assets ( percent)
Gujarat	123	0	0
Jammu & Kashmir	19	0	0
West Bengal	264	19	7.2
Madhya Pradesh	172	2	1.2
Kerala	286	1	0.3
Tripura	623	1	0.2
<b>Total</b>	<b>1487</b>	<b>23</b>	<b>1.5</b>

*Source:* Primary data collected from field

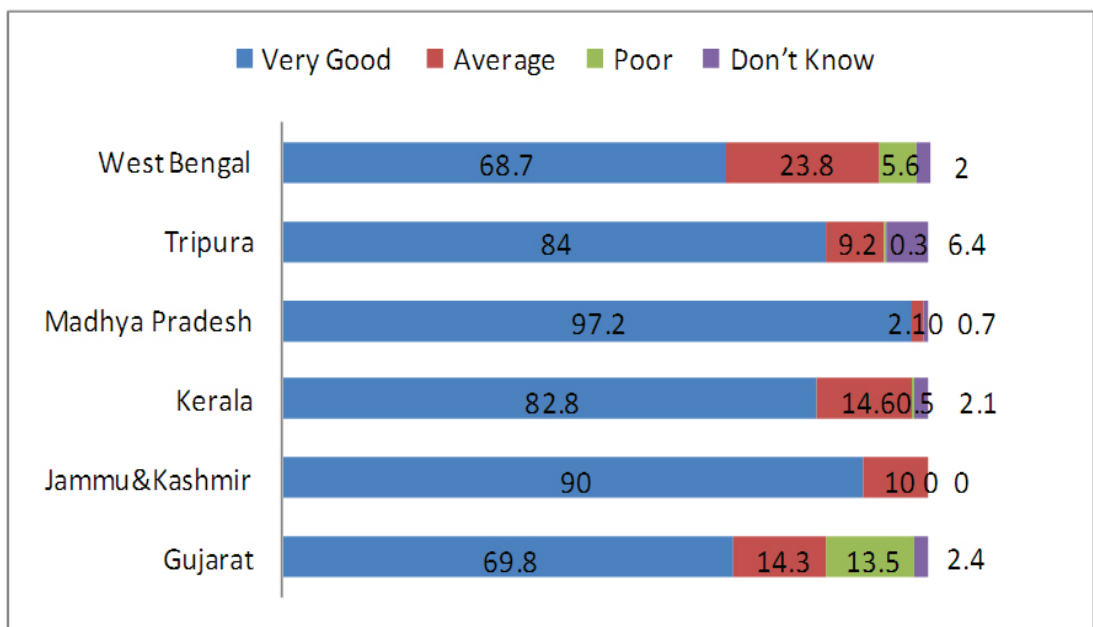
## STATUS OF ASSETS

The study finds that overall only three states have initiated the convergence with line departments.<sup>6</sup> Among the total assets created, only one percent assets were created through convergence. In Gujarat, the convergence was found with forest department and nine percent assets were created through convergence. In Kerala, there has been convergence with the agriculture department but on a very small scale.

### Quality of Assets

The survey found that a majority of the respondents (81.4 percent) perceive that the quality of asset is “Very good”. Only 13 percent beneficiaries have reported that the quality of assets is average and two percent beneficiaries have answered that the quality of assets is poor (Figure

2). It is seen that 47.8 percent individual assets and 52.2 percent community assets are very good in quality. Further 44.3 percent individual assets and 55.7 percent community assets were found to be average in quality. Horticulture (22.2 percent), Drought proofing (58.3 percent) were found to be the ones reported to be of poor quality. Particularly the respondents reported that the quality of plants was very poor. Further 39.3 percent land development assets, 14 percent flood protection, irrigation facility and drought proofing works were found to be of very good quality. More than three fourth of respondents from Jammu & Kashmir, Kerala, Madhya Pradesh and Tripura have claimed that the quality of work is very good. Near to one fourth of respondents from West Bengal have reported that the quality of asset is average. Majority (13.5 percent) of respondents from Gujarat have reported that the quality of asset is poor. (Figure 2).



**Source:** Primary data collected from field

**Figure 2: Quality of MGNREGA Asset**

### Relationship between quality of assets and select variables

Out of six variables, correlation coefficient of four variables namely types of assets (.212), Social group of beneficiary (.081), and Economic status of beneficiary (.080), Awareness of beneficiary on MGNREGS planning (.113) is highly significant and positively correlate with the quality of work (Table 3). It defines that the quality of asset created depends on the types of assets created and awareness of beneficiary on MGNREGS planning process. The quality of asset created in individual land also depends on social group of beneficiary and economic status of beneficiary.

**Table 3: Correlation analysis of quality of assets**

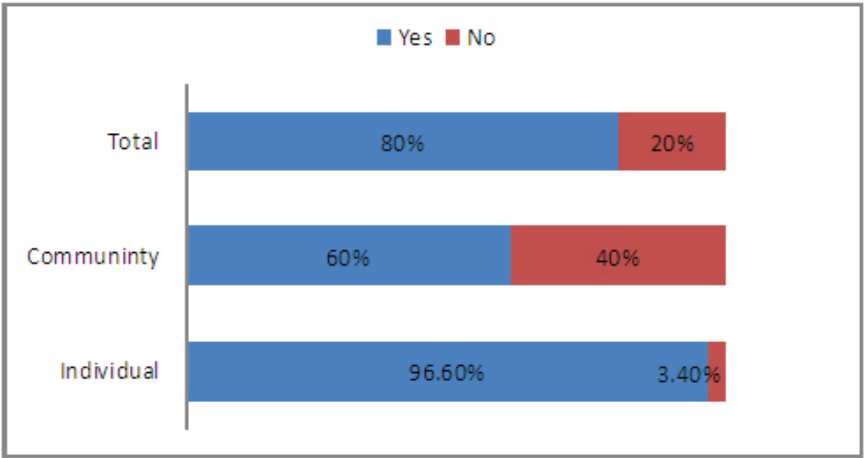
S.No	Variables	Coefficient correlation (r)
1	State	-.014
2	Category of assets	.011
3	Types of assets	.212**
4	Social group of beneficiary	.081**
5	Economic status of beneficiary	.080**
6	Awareness of beneficiary on MGNREGS planning	.113**
*Correlation is significant at 0.05 level of probability		
** Correlation is significant at 0.01 level of probability		

### Condition of assets

More than three fourth (76.1 percent) of the assets were found in “Good condition”. One out of five (20.2 percent) assets was found partially damaged and two percent of assets were “Fully damaged”. More than one third (42.3 percent) of community assets and 4.5 percent of individual assets are partially damaged. Four percent of community assets and one percent of individual assets are fully damaged. It is evident from the data that the community assets are more damaged than individual assets. Tripura and Madhya Pradesh are top two states having more than 80 percent of good condition of asset. It is followed by Gujarat, Jammu & Kashmir, and West Bengal which are having more than 70 percent of “Good condition” assets. Kerala is the only state which is having low percent of assets in good condition. More than 90 percent of the water harvesting, rural sanitation and other public works are in good condition. More than 80 percent of flood protection assets are partially damaged. More than three fourth of drought prone works are fully damaged.

### Maintenance of Assets

More than three fourth of assets are maintained by the beneficiary. It is apparent from the study that 40 percent community assets are not maintained by the community and 3.4 percent individual assets are not maintained by beneficiaries (Figure 3). The maintenance of asset is essential and where the assets are not maintained there is every possibility of damaging the assets. Further it is observed that near to three fourth (73.4 percent) of flood protection assets and one third of rural sanitation works were not maintained. One fourth of rural connectivity works and more than 10 percent of land development, water conservation and irrigation facility works were also not maintained. Tripura (98.7 percent) is holding the first rank in maintaining the assets followed by West Bengal where 86.4 percent of assets were maintained by the beneficiary. Kerala is having highest number of assets (51.7 percent) that were not maintained properly. One third of assets in Gujarat and Madhya Pradesh were not maintained.

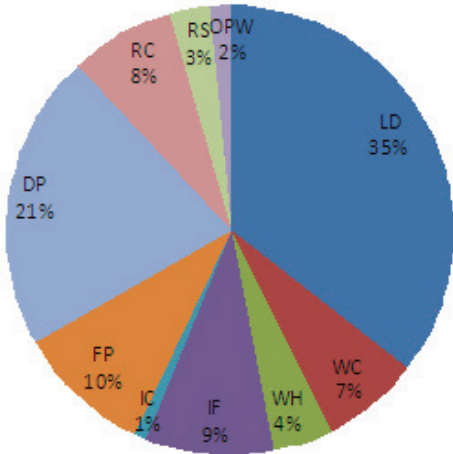


Source: Primary data collected from field

Figure 3: Maintenance of assets (Individual Vs Community)

MGNREGA ASSETS AND THEIR USES

Of the assets verified, awesome proportion supported farming activities, directly or indirectly. One third of the assets were on land development. It includes land levelling, earth filling, plantation, clearance and platform. A comparable share of assets pertains to water conservation and harvesting. Majority of water related assets were created on public land. It includes digging pond, digging well, desilting of lake, farm pond and supply channel. Most of the water related assets are renovation of existing structure. Flood protection, drought proofing, roads and toilets were accounted for rest.



Source: Primary data collected from field

Figure 4: Assets types surveyed

The distribution of sample assets across the states reflected the diversity of the states according to their local needs. Majority of the assets in Tripura are land development where the community needs land levelling works. The barren land were levelled and used for house construction as well as cultivation. Tripura had a lion's share of land development assets. Horticulture plantation works on private land was found more in West Bengal. The plants were provided by the forest department and planted through the MGNREGS labour force.

### Usefulness of assets

It is evident from the study that more than two third (84.6 percent) assets are "Very useful" to the beneficiary and 12.4 percent beneficiaries felt that the asset created under MGNREGS is "Somewhat useful."<sup>7</sup> Further two percent beneficiaries reported that the assets are "Not useful"(Table 4). The individual and community assets were rated equal in terms of their usefulness. Many of the drought proofing (58.8 percent) and horticulture (23.5 percent) assets were reported to be non-useful. It indicates that quality of work may not have been good. It was also possible that those households which participated in MGNREGA assets selection process in Gram Sabha found assets most useful to them.

**Table 4: Assessment of usefulness**

Usefulness	Percentage	Number of responses
Very useful	84.6	1443
Somewhat useful	12.4	212
Not useful	2	34
Can't say/Don't know	.9	16
Total	100	1705

**Source:** Primary data collected from field

Generally, there was not much variation in usefulness of assets based on types of assets. Other public works, Water conservation and Land development assets were found to be "Very useful" by 100 percent, 91.5 percent and 90.5 percent respectively. The respondents felt that creation of asset in individual land is greater incentive for them. Horticultural works and drought proofing assets were found "Very useful", by only 37.8 percent and 72.5percent respondents respectively. Close to 10 percent of respondents reported that the horticulture and 20 percent drought proofing assets were "Not useful". The major share of horticulture works were done in West Bengal where the quality of plants was not good and the fencing was not done. The respondents reported that though fertilisers were included in maintenance, same was not provided.

### Extent of benefits

As per field data, the assets surveyed had generated 1066703 mandays and the mean persondays of asset created is 717. Over the assets created, the average wage paid per beneficiary household is Rs.3,122. Asset surveyed benefitted 66454 families. The roads had

the widest impact, as one would expect with 243 households benefitting on an average from all the assets surveyed. The total number of household benefited through rural connectivity asset surveyed is 62254.

The MGNREGS created significant impact on migration in eight states. In Tripura, the migration has come down to zero in sample Gram panchayat. In Gujarat the study finds that the migration has decreased to 65 percent. It is revealed from the study in Madhya Pradesh and Kerala, that migration has reduced by 50 percent.

### **IMPACT OF MGNREGA ASSETS ON AGRICULTURE**

From the study, it is clear that small and marginal farmers were benefited through the MGNREGA. The average size of land owned by the sample household was 1.7 hectares, and the median land holding size was one hectares. The household most likely to benefit from MGNREGA assets were farmers with either small or marginal land holding size. While surveying MGNREGA assets on private lands, it was found that assets were on lands that belonged to small (75%) and marginal farmers (18%). Rest of the beneficiaries were big farmers. The small and marginal farmers were not willing to give their land for asset creation due to small land holding size. Among the farmers benefited, majority of them were Scheduled caste (21.7 percent) and Scheduled tribes (14.7 percent). Further half (51 percent) of the farmers benefited were Below Poverty line (BPL).

#### **Nature of benefits on Land development work**

The study provided evidence that many of assets created under MGNREGS represented new and substantive additions to the resource base and infrastructure, the extensions or additions of assets aimed at improving the functionality of existing assets. An overwhelming majority of respondents claimed that the land value has increased through the land development work done in individual land.

Among the sample assets, 64.4 percent of land development has been done (out of 2576 acres 1661 acres) through MGNREGS land development activities. The beneficiaries reported that, on an average there has been an increase in the land value up to 100 percent through MGNREGS land development activities. In other words, on an average the land value in India which was Rs. 18, 72,786/- per acre has increased to Rs.35, 42,225/- per acre through MGNREGS land development activities and other factors.

In the state like Tripura, the land development works were useful for the beneficiaries to construct the house and it fulfilled the basic needs. Further the developed land was also used for cultivation and the barren land brought into the cultivation. More than half (59 percent) of beneficiaries claimed that due to land development work, the income of the family has increased. Several farmers claimed that their families were able to have three meals in a day with the help of developed land. Few of them also reported that the water level has increased and the sanitation facilities improved.

#### **Nature of benefits on irrigation works**

On water conservation, water harvesting, irrigation, flood protection and drought proofing, a wide range of uses were cited. An overwhelming majority of respondents suggested that they



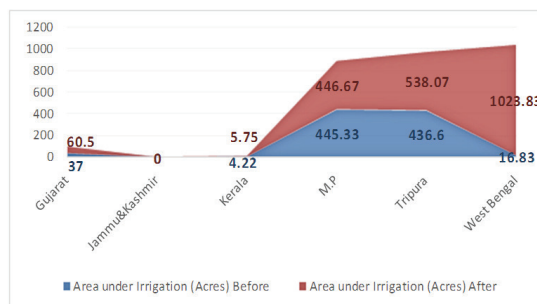
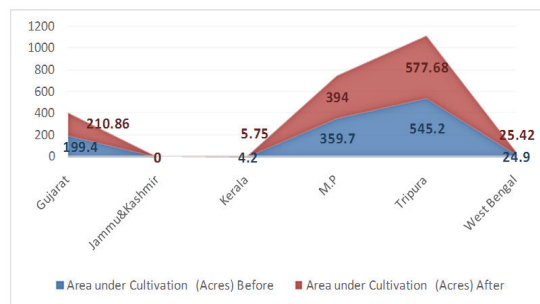
had been able to change the cropping pattern. Among the farmers who claimed changing of cropping pattern, close to one fourth of farmers reported that they were able to cultivate double cropping. Near to five percent claimed that they were able to cultivate multi crops. Further 3.5 percent of farmers reported that they shifted from dryland crops to irrigation crops. The water assets also benefited farmers to increase the utilisation of family labour, increase production, increase income and to reduce the migration for labours.

### Impact on Agriculture productivity

Overall 56.3 percent of farmers felt that there is a “significant increase” in productivity. Further one fourth (28 percent) of farmers claimed “moderate increase” in productivity followed by 3.5 percent who reported “less significant” impact on productivity. It is also evident that whenever the quality of asset was rated good; the farmers also responded that created assets benefited significant increase in productivity. Cent percent of farmers from Kerala reported the “significant increase in productivity” and more than three fourth of farmers from Madhya Pradesh, and Gujarat claimed significant increase in productivity. Higher percent of farmers from Jammu Kashmir and West Bengal reported less significant impact of asset creation on farm productivity.

### Impact on Area under cultivation and irrigation

The individual farmers in the sample reported that totally 268.6 acres of un-cultivable land has become cultivable land through MGNREGS work. Further 1404 acres of land has got irrigation facilities through the water harvesting work. On the whole around seven percent of the land has become cultivable land through MGNREGS water harvesting and irrigation activities. There is a significant impact of MGNREGS assets on extending irrigation facilities (26.4 percent) compared to pre-MGNREGA interventions. Tripura, West Bengal, Madhya Pradesh and Kerala were the states; where the area under cultivation has increased.



**Source:** Primary data collected from field

**Figure 5: Area under cultivation**

**Figure 6: Area under irrigation**

## SATISFACTION WITH MGNREGS

Among those interviewed, at the national level 75 percent of beneficiaries reported complete satisfaction followed by 14 percent beneficiaries reporting that they were partly satisfied and another one percent of beneficiaries reported dissatisfaction. Almost 99 percent of the beneficiaries are happy with MGNREGS implementation.

## SUMMARY AND CONCLUSION

The study carried out the perception of beneficiaries on MGNREGS assets as to whether the MGNREGS is perceived anti-farmer because it employs workers in huge numbers but the study found that the assets are beneficial to agriculture and primarily benefits small and marginal farmers significantly. MGNREGS is functioning as supplement for agriculture. The common perception held nationwide is that many of MGNREGS assets exist only on paper and not on the ground and does not create anything productive. But, the survey found that the assets physically exist in the field as per MIS and asset register. Thus, the perception is not completely true. Further it is perceived that MGNREGS assets are not durable. It is not either true because majority of respondent suggests that the quality of asset is very good. The assets were maintained by the beneficiary and an average of Rs 8000 was spent by the beneficiary to maintain the asset created in their land. To improve the quality and uses of assets, greater attention need to be given in selection of assets based on needs of local community. As study findings show, land value has increased due to individual land development activities. More focus and priority should be given to build individual assets as well as for land development activities. MGNREGS has resulted into value capture by the beneficiaries.

## ACKNOWLEDGEMENT

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## ENDNOTES

1. Other studies include Sushanta Kumar Mishra (2011); Shilpi Verma and Tushar Shah (2010); Govind Kelkar (2011).
2. Administrative data classify works into the following categories- Land Development (LD), Water Conservation(WC), Water Harvesting(WH), Irrigation Channel(IC), Irrigation Facility(IF), Flood protection(FP), Drought Proofing(DP), Drinking Water(DW), Rural Connectivity(RC), Rural Sanitation(RS), Seva Kendra(SK), Other Public Works(OPW).
3. The regions were considered as following administrative classification as follows: North, East, West, South, Centre and North East region.
4. There was no explicit effort to select respondents based on gender and this aspect has not been considered in the study.
5. The study founds the assets that did not exist as Individual assets were mostly, horticulture crops, renovation of private ponds in individual land and land development works.
6. Convergence departments or line departments includes 29 departments for example, Rural Development, Forest, Public Works Department, Water and Sanitation Department, Agriculture department, Animal husbandry, horticulture department etc.

7. The user perception was collected only for the assets related to water and land development assets on individual as well community-basis.

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# ABSORPTION SPECTRA OF $\text{Cu}_2\text{WS}_4$ : A HYBRID FUNCTIONAL APPROACH

Narendra Kumar\*

Piyush Dua\*\*

## ABSTRACT

*It has been predicted that Tungsten (W) and Molybdenum (Mo) based materials increase the chemical activity for photo-electrochemical water splitting.  $\text{Cu}_2\text{WS}_4$  is one of the semiconductors with a band gap of 2.0eV which is more than sufficient to absorb visible spectrum of sun light for hydrogen production. In  $\text{Cu}_2\text{WS}_4$ , it has been shown that W contributes mainly in absorption and S & Cu contribute in emission spectra based on a recently developed approach which involves only one arbitrary parameter. In our method, a tunable component of exact exchange has been introduced for the relevant Kohn–Sham orbitals for optimum results for lattice parameter and band-gap determination.*

**Keywords:** Absorption spectra, d-electron systems photo-catalysts, photo-electrode.

## INTRODUCTION

Hydrogen has been considered to be the fuel for future. Hydrogen can be produced through various resources including fossil fuels, such as coal and natural gas, nuclear and biomass and other renewable energy technologies, such as wind, solar, geothermal and hydroelectric power [1]. However, currently, the greatest technical challenge to hydrogen production is cost reduction. Therefore, it is urgent to discover and develop less expensive and environment friendly methods for hydrogen production and for which a few materials are required which can fulfill all the requirements of hydrogen generation process such as cost reduction with high life time. Solar hydrogen production from water without non-regenerated energy consumption and  $\text{CO}_2$  emission has been believed to be of great economic and environmental interest, considering the issues of energy cost and environment protection. As one of the several ways for solar hydrogen production, semiconductor-based photocatalytic water splitting into  $\text{H}_2$  and  $\text{O}_2$  has attracted intense research interest [2, 3]. The importance accorded to extracting hydrogen

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from water is driven by the requirement to find a renewable, sustainable and environmentally safe alternative energy source. Hydrogen is considered as a viable option to today's fossil fuel-based energy source especially when it is produced from water and only sunlight is the energy input [4]. Hydrogen is an energy carrier, when used in fuel cell which combines it electrochemically with oxygen from air thus producing water and energy in the process [5]. This completes the consumption and regeneration cycle of hydrogen.

Photo-electrochemical (PEC) water splitting has the potential to be an efficient and cost effective way to produce hydrogen where the photo-electrode in PEC system absorb sunlight and split water directly into hydrogen and oxygen. The main work in PEC water splitting is still concerned with increasing the efficiency and stability of the photoactive materials [6, 7] to achieve the required efficiency target of 10% that will be viable for commercialization [8].

At the moment stable photo-electrode materials based on metal oxide have rather low efficiency of several percent [9, 10] while high efficiency materials based on multi-junction conventional semiconductor can achieve slightly above 10% [11,12], but get degraded within a short time.

Since the introduction of PEC water splitting process, the field has been developed as a separate research area to study different kinds of semi-conducting materials which have been developed as photo-catalysts for hydrogen production for water. Out of the materials identified for PEC water splitting, most of them could work in the ultraviolet region which can occupy a small fraction of the incoming solar energy. A lot of materials have been proposed that can work under visible light. A big list of materials is available which can provide an efficiency of about 7%, under visible which is still far from the starting point for practical application which is 30% at 600nm [13]. Therefore, it is still a challenge to identify such material which can fulfill all the requirements for PEC water-splitting process.

The aim of PEC material fabrication is to design a photo-electrode that has the potential to satisfy most of the requirements viz. (a) sufficient visible light absorption i.e. band gap in the range of 1.8-2.2 eV, (b) efficient separation and fast transport of photo-generated electron-hole pairs to prevent recombination, (c) favorable conduction and valence band edge position with respect to redox potential of water, (d) non-corrosive and high chemical stability in the electrolyte, and (e) low cost. Large band gap semiconducting oxides such as  $\text{TiO}_2$ ,  $\text{WO}_3$ ,  $\text{SrTiO}_3$ ,  $\text{BaTiO}_3$ ,  $\text{SnO}_2$ ,  $\text{ZnO}$  etc. are stable in aqueous electrolyte but absorb in UV region which is only about 3% of the solar spectrum, whereas small band gap semiconductors such as Si, GaAs, InP, CdTe, CdSe, CuO etc. and optimum band gap semiconductor viz.  $\text{Cu}_2\text{O}$  have the potential to absorb visible part of solar spectra but corrode when dipped in electrolyte [14,15]. Intermediate band gap semiconductor like  $\text{Fe}_2\text{O}_3$  absorbs in the visible region but suffer from poor semiconductor characteristics due to redox level mismatch, low mobility of holes and trapping of electrons by oxygen-deficient iron sites. In order to improve the lifetime of PEC system, the semiconductor material must have adequate electrochemical stability so that the charge carriers reaching at its surface drive only the water splitting reactions without any side reactions (i.e. electrode corrosion). Semiconductor materials are found to be more resistant to reduction reactions than that of oxidation reactions, which makes p-type material more suitable than n-type material with respect to stability. Alternatively, the thermodynamic

instability of photo-electrodes is due to the ability of photo-generated holes to oxidize the semiconductor [16].

Recently,  $\text{BiVO}_4$  doped with Mo and W have shown very high catalytic activity. It was shown that appropriate W or Mo doping conditions would lead to much higher photocurrent generation activity and water photo-oxidation [17].

In addition, high cost and life time are the major challenges which need to be taken care of. Recently  $\text{Cu}_2\text{WS}_4$  has been proposed which can play a role for PEC water splitting[18].  $\text{Cu}_2\text{WS}_4$  is a semiconductor with a band gap of approximately 2.0 eV and includes two species which are members of so called d-electron systems i.e. Cu ( $\text{Ar}3\text{d}^{10}4\text{s}^1$ ) and W ( $\text{Xe}4\text{f}^{14}5\text{d}^46\text{s}^2$ ). Usually d-electron system show strongly correlated behavior and theoretically utmost care is required to deal with such systems. In the present work, we have studied the ground state properties like lattice parameters and band-gap determination as well as absorption spectra within the UV-visible range.

## CALCULATIONS

The electronic structure of  $\text{I-Cu}_2\text{WS}_4$  was studied within density functional theory formalism. To calculate the electronic structure and lattice parameters of  $\text{Cu}_2\text{WS}_4$ , we have used full-potential linear augmented plane-wave (FLAPW) method as implemented in the WIEN2k code [19-21]. We have applied a recently developed approach in which a small component of exact exchange (which we will refer to as  $\alpha$ ) has to be added for the relevant Kohn–Sham orbitals (d-electrons only here), which can be calculated rather simply within the muffin tin of an APW method. This is similar to a LDA/GGA + U method, but with a U value that will vary with local environment avoiding the need to tune U for specific cases. Recently  $\text{Cu}_2\text{WS}_4$  has been studied by BP86 functional [22] incorporated in ORCA code [23] for structural properties.

The value of  $\alpha$  for a particular system can be tuned, i.e. a compromise can be used. The value of  $\alpha = 0.6$  with the PBE functional gives the better results as far as the band gap determination is concerned, but at the same time lattice parameters deviate from the experimental values with considerable extent. Therefore a value  $\alpha = 0.4$ , would have been used for  $\text{Cu}_2\text{WS}_4$  which gives better comparison for both band gap as well as lattice parameters. The band structure and partial density of states were calculated and compared for analysis.

Based on the structure and atomic arrangements,  $\text{Cu}_2\text{WS}_4$  can have two lattice structures which are named as  $\text{p-Cu}_2\text{WS}_4$ , and  $\text{I-Cu}_2\text{WS}_4$ . In the P polymorph the molybdenum atoms in adjacent layers are located directly above each other, giving a lattice with primitive centring. In the I polymorph, the molybdenum atoms in adjacent layers are offset by half a unit cell in the a- and b-directions; molybdenum atoms in one layer lie above a metal vacancy in the next layer, presumably minimizing unfavorable electrostatic interactions. Basically,  $\text{I-Cu}_2\text{WS}_4$  is fabricated by  $\text{Cu-S}_4$  and  $\text{W-S}_4$  tetrahedral units. **Fig.1** shows the atomic structure of  $\text{Cu}_2\text{WS}_4$  decahedron viewed from arbitrary direction. It is obvious that it contains broken  $\text{Cu-S}_4$  or  $\text{W-S}_4$  tetrahedrons. **Fig. 2** shows the Density of States (DOS). It is evident that valance band composed of S 3p and Cu 3d orbits, whereas S 3p, W 5d, Cu 3d orbits constituted the conduction band. In addition, absorption spectra have been calculated which is shown in **Fig. 3**.



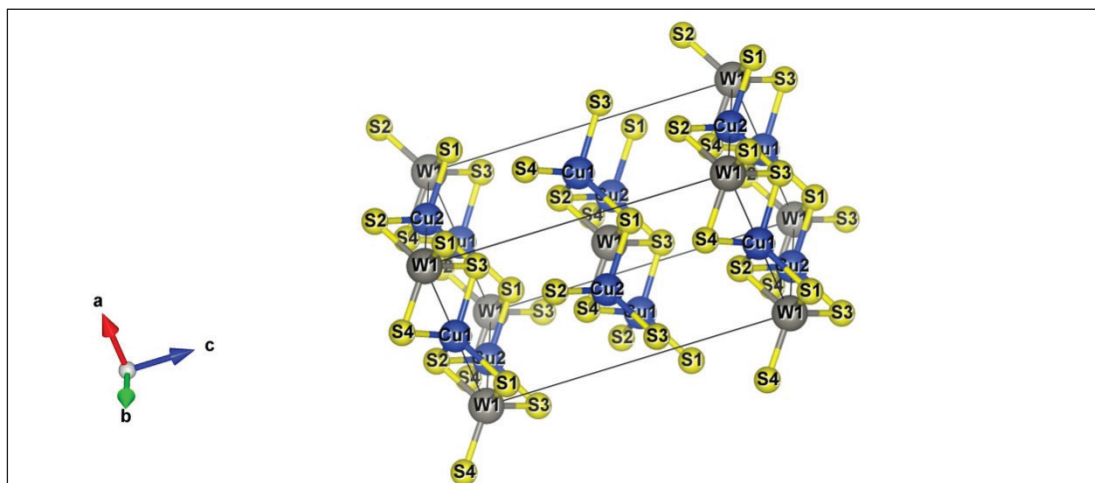


Figure 1: Lattice structure of  $\text{Cu}_2\text{WS}_4$

## RESULTS AND DISCUSSIONS

Evans *et. al.* had synthesized and determined the structural characterization of body centred polymorph of  $\text{Cu}_2\text{WS}_4$  prepared using hydro thermal methods. I- $\text{Cu}_2\text{WS}_4$  crystallizes in space group I-42m with experimental cell parameters  $a=b=5.440 \text{ \AA}$ ,  $c=10.07 \text{ \AA}$  and has new structure type containing layers of edge-sharing  $\text{CuS}_4$  and  $\text{WS}_4$  tetrahedra. The structure of  $\text{Cu}_2\text{WS}_4$  was determined by powder X-Ray diffraction data [24]. Gan and Schwingenschlogl studied two-dimensional mono-layers and nano-ribbons, they found the little smaller band gap values than the present study [25].

The purpose of using present proposed technique is to get results of lattice parameters and band gap with a balance between both computational and experimental values. For this purpose, we have done calculations with GGA and value of  $\alpha = 0.4$  with the PBE functional and compared the results given by these two approximations. Using value of  $\alpha = 0.4$  with the PBE functional gives lattice parameters with space group I-42m with cell parameters  $a=b=5.510 \text{ \AA}$ ,  $c=10.110 \text{ \AA}$  which does not deviate much from the experimental values.

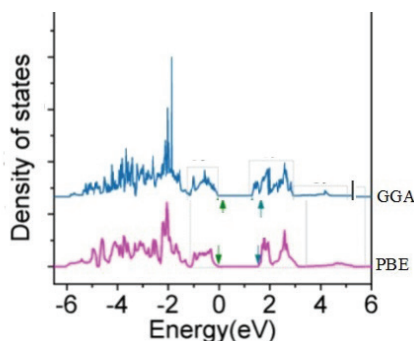
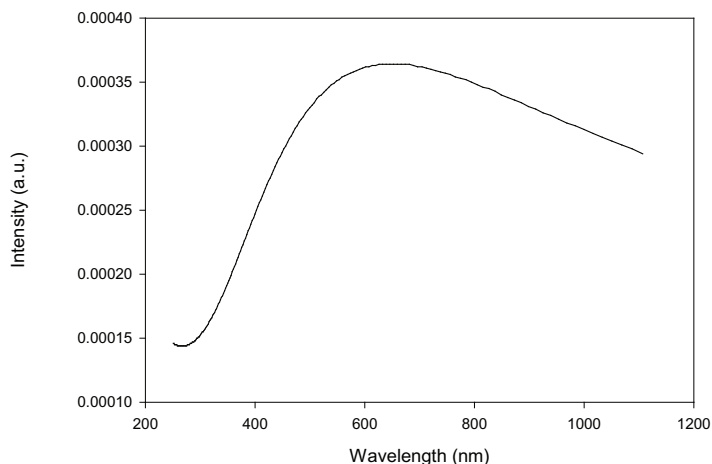


Figure 2: Comparison of Density of States calculated by GGA and PBE (+ $\alpha$ ) functional

A trend has been observed in which the bandgap increases with increase in the value of  $\alpha$ . The optimized volume and lattice parameters decrease with increase in the value of  $\alpha$ . Therefore the value of  $\alpha$  can be chosen such that the balance can be maintained between both the lattice parameters calculations and bandgap determination.

Therefore a value  $\alpha = 0.4$ , would have been used for  $\text{Cu}_2\text{WS}_4$  which gives better comparison for both band gap and lattice parameters. The calculated structure has been shown in **Fig.1**. **Fig. 2** shows the partial density of states of  $\text{Cu}_2\text{WS}_4$  using GGA approximation which gives the band gap about 1.4 eV. From fig. 3, it is clear that W is contributing mainly in absorption.



**Figure 3: Absorption spectra of  $\text{Cu}_2\text{WS}_4$**

It is clear that band gap increases compared to GGA functional and comes out to be 1.8 eV. But we need to make a lot of compromise with lattice parameters. We have also tried with increased value of  $\alpha = 0.6$  with the PBE functional to improve the value of bandgap towards experimental value. The value of bandgap improves and comes equal to experimental values 2.0 eV, but  $\alpha = 0.6$  with the PBE functional takes the lattice parameters far away from the experimental values. Therefore value of  $\alpha = 0.4$  with the PBE functional is an appropriate value for  $\text{Cu}_2\text{WS}_4$ , which makes a balance between lattice parameters and bandgap.

$\text{Cu}_2\text{WS}_4$  has been proposed to play role for PEC water splitting [18]. To split water, 1.7 eV potential is required which comes under the UV-visible region of light spectrum.  $\text{Cu}_2\text{WS}_4$  is able to generate sufficient photo-voltage to split water into hydrogen and oxygen. It can be seen through the absorption spectra computed and shown in **Fig. 2** which is equivalent to bandgap of 1.8 eV.

## CONCLUSIONS

In the present work, we have carried out Density Functional Study of  $\text{Cu}_2\text{WS}_4$  using PBE functional with a small component of exact exchange (defined as  $\alpha$ ). In the present case  $\alpha = 0.4$  has been found to be appropriate for the lattice structure calculation and band

structure calculation. This technique has given the results which are in good agreement with the experimental results. This technique requires very less computational resources compared to LDA/GGA + U or many-body perturbation theory (GW) approximation. For other materials “ $\alpha$ ” can be chosen in such way that results for both the lattice parameters and bandgap calculations can be determined without doing much compromise in comparison to the experimental values.

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# NATURE OF GANDHIJI'S APPEAL: RELIGION OF HUMANITY WITH PARTICULAR REFERENCE TO RAJA RAO'S KANTHAPURA AND MULK RAJ ANAND'S UNTOUCHABLE

*Dr. Surekha Ahlawat\**

## ABSTRACT

*Mahatma Gandhi emerged as a legend during his life time. This was neatly captured by the literati in their novels. Mulk Raj Anand created a myth about the Mahatma as incarnation of Hindu gods in the novel, "Untouchable". Similarly, the linguistics and stylistics of Raja Rao's "Kanthapura" are reminiscent of ancient Indian epics. Both, Mulk Raj Anand and Raja Rao, succeeded in imparting mythical dimension to Gandhiji's personality in "Untouchable" and "Kanthapura", respectively. Both novels were written in English in the mid-thirties. It must be admitted in all fairness that in mythologizing Gandhiji and imparting legendary qualities to him, both were inspired by Gandhiji's religion of humanity. This paper is an attempt to understand the background for the composition of these two popular novels.*

**Keywords:** British rule, communal harmony, Hari Katha, Krishna, Mahatma Gandhi, myth, Vishnu.

## INTRODUCTION

On the occasion of 70th birthday of Mahatma Gandhi, Einstein one of the greatest scientists of the 20th century paid him a tribute interspersed with epithets that smacked of the 'holiness of the heart's affections': "Generations to come will scarce believe that such a one as this ever in flesh and blood walked upon the earth". Little did Einstein realize that by making generations of people dubious about the corporeal frame of the personality of one of the greatest sons of history, he was not only imparting a mythopoeic quality in his estimation, but also imparting a quality full of the legendary character to the savant. Such was the magnetic appeal of the social reformer, freedom fighter and crusader of human rights that myths began to be formed about him wherever he left the impress of his footprints.

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Nicholson Kai(1972) in his perceptive work *A Presentation of Social Problems in the Indo-Anglian and the Anglo-Indian novel* makes a very pertinent remark about the presence of the Mahatma in the Indo-Anglian novels after the thirties. “A character who loomed large in Indo-Anglian fiction during and after his lifetime is Mahatma Gandhi” (p. 56). Sometimes the Mahatma appears as a person as in *Untouchable* (1935) and *The Sword and the Sickle* (1942). It influences the central character Moorthy who can be regarded as a rural Gandhi. His ideology influences Mulk Raj Anand in his novel, *The Road*. There are other books that represent Gandhian thought and politics like in Venkataramani’s *Murugan, The Tiller* (1927), and *Kandan, The Patriot* (1932). The Gandhian ideology is worked out in C.N. Zutshi’s *Motherland*(1944), Zeenat Futehally’s, *Zohra* (1951) and Manohar Malgaonkar’s, *A Bend in the Ganges* (1964).

This article is a humble effort to show the inexplicable nature of Gandhiji’s appeal and the way he was transformed into a myth and a legend in his lifetime. Both Anand and Raja Rao found appeal in him more irresistibly than any other conventional religion.

### SETTING THE TWO NOVELS

Anand and Raja Rao succeeded in imparting mythical dimension to Gandhiji’s personality in *Untouchable* and *Kanthapura*, respectively. Both novels were written in English in the mid- thirties. It must be admitted in all fairness that in mythologizing Gandhiji and imparting legendary qualities to him, both were inspired by Gandhiji’s religion of humanity.

It is in the fitness of things to understand the background for the composition of Anand’s novel *Untouchable*. In April, 1929, Anand went to Sabarmati Ashram and met the Mahatma in the sweltering heat of Gujarat. He gave a copy of his novel, ‘*Bakha*’ to Gandhiji. Gandhiji was vehemently opposed to any novel that depicted any romantic love story of a boy and a girl. Anand had to do a lot of haranguing to convince a fastidious Gandhiji that the novel that he had written was actually composed on the same lines as that of the Mahatma’s story on a sweeper boy, Uka.

In the course of his stay at Sabarmati Ashram for three months, Anand had a feeling of usufruct. Living and working under the guidance of Mahatma, his moral values registered a sea-change. He learned to value above all, a life of sincerity, truth and simplicity, the sterling qualities embodied in the personality of the Mahatma.

At the end of those three months, when he read some portions of the novel to Gandhiji, the latter suggested that he should cut down some irrelevant portions of the novel, particularly those pages which presented Bakha as a Bloomsbury intellectual, occupied in reflections and dreams. Acting upon Gandhiji’s hortative, Anand revised the entire novel. The size of the novel was cut drastically from two hundred and fifty pages to one hundred and fifty pages. Finally, Gandhiji gave his approval to the publication of Anand’s *Untouchable*.

Gandhiji’s words of inspiration, his role as a social reformer, his civilized grace, his sobriety stemming from his Indianness and impeccable simplicity created an indelible impression on his mind. The magnetism of Gandhiji’s personality had cast such a spell on Anand’s mind that he decided to present him in person in the novel. Small wonder, he showed Mahatma



Gandhiji addressing a mammoth crowd in Golbagh on the problem of untouchability in the novel *Untouchable* and in doing so, presented him as a revolutionary iconoclast.

Colonel Hutchinson of the Salvation Army had proselytized Bakha and tried to prevail upon him the spiritual and social advantages of his conversion to Christianity. But his talks wearing on the importance of social equality in Christianity was nothing more than a 'conundrum' to Bakha. Chewing the cud of Hutchinson's words of sermonisation, Bakha stumbled upon a huge crowd of people at Golbagh ground. Such was the magnetic appeal of Gandhiji's personality that it cut deep into different cross-sections of the Indian society. Bakha's eyes could see Hindu traders from the markets of Bulashah dressed in elegant silk, Kashmiri Muhammadans from the carpet factories, Sikh rustics from close by villages, red faced Pathans, swarthy skinned Christian girls of the Salvation Army all had thronged "to meet the Mahatma, to pay homage to Mohandas Karamchand Gandhi. (*Untouchable* pp. 126-127).

People from various cultures and religions had assembled at Golbagh to listen to the spiritual message of the Mahatma. The scene is indicative of the nature of Gandhiji's appeal. Gandhiji's message of unity can bind people of different faiths and cultures. Anand glorifies the image of the Mahatma because he knows from the core of his heart that the untouchable section of the Indian society, the Mahatma is no less than a god who can wipe away the last vestiges of untouchability from the country. Bakha's uncertainty about the would-be speech of the Mahatma is clouded by doubts. He asks himself, "Is he really going to talk about the outcastes, about us, about Chota, Ramcharan my father and me? (*Untouchable*, p. 132). His doubts about the integrity of the Mahatma are set at rest when suddenly the voice of the social reformer rings loud and bold: I regard untouchability as the greatest blot on Hinduism" (*Untouchable*, p. 137). Then Gandhiji makes the emotional declaration: If I have to be born I should wish to be born as an untouchable so that I may share their sorrows, sufferings and affronts levelled at them in order that I may endeavour to free myself and them from their miserable condition. (*Untouchable*, p. 138).

Bakha is further moved by the sincere declaration of the Mahatma to include the outcastes in the mainstream of the Indian society: public wells, roads, schools and temples should be opened to the untouchables. When Gandhiji becomes critical of the unclean habits of the untouchables and enjoins upon them to inculcate habits of cleanliness, Bakha blames the Mahatma in his heart of hearts.

Anand creates a myth about the Mahatma. To several people in the crowd he is an incarnation of the gods, Vishnu and Krishna. Bakha listens closely to a Hindu as he blurts out saying, "the Sarkar is afraid of him" (*Untouchable*, p.152). The vociferous Hindu supplements the statement by saying that the local magistrate had withdrawn his order that previously banned the entry of Gandhiji to Bulashah. Another Hindu from the crowd is quick to state that the British government had released Gandhiji from jail without any terms and conditions. Meanwhile, a rustic emerges from the crowd to enquire if Gandhiji can overthrow the government. A babu standing close at hand replies that Gandhiji not only has the power to overthrow the British government but also has the power to change the world. This hyperbolic extreme reinforces the mythical image of the Mahatma. The babu grows voluble in his praise of Gandhiji. Without mincing words, he speaks of the British government and states loudly

that the British government is nothing before the Mahatma. Then he showers encomiums on Gandhi's religious culture and states in no uncertain terms that it is India's religious culture that makes her superior to the West. He further states that neither cigarettes nor sensual pleasure can lead people to the path of religious discipline which is found in India and this religious discipline ushers in the highest form of bliss in the world. He affirms that Gandhiji would show the path of religious discipline to the people of the modern world. Besides this, he would teach the new generation the love of God. A person in the crowd listens to the words of the Mahatma with rapt attention. To this stranger Gandhi was a legend, a tradition and an oracle (*Untouchable*, p.153). The babu had told him of the numerous miracles which the Mahatma had performed. On several occasions, he had heard that Gandhiji was an incarnation of Lord Krishna.

From this we infer that the local people were so carried away by the social and political reforms of Gandhiji that they either saw him as a saint or an incarnation of God. The lower castes were trying to align themselves with the Muslims and the Christians and the efforts of Colonel Hutchinson evinced that. This was an alarming threat to the Hindu community and the Hindu community was the very model of the nation. Bakha knew that on account of his being a member of the low caste there was an inseparable barrier between himself and the crowd. He was hopeful that the only man who could forge a unity with the crowd was none other than Gandhiji. Anand opined that Gandhiji was in everybody's mind including Bakha (*Untouchable*, p. 151). This was not only a significant pointer to the mass appeal of Gandhiji but also a pointer to Gandhi's religion of humanity.

The linguistics and stylistics of *Kanthapura* are reminiscent of ancient Indian epics. The village Kanthapura is an archetypal Indian village of South India where Mahatma Gandhi is a living presence. Gandhiji's philosophy of life and political struggle are truly mirrored by the thoughts and actions of multiple characters in the novel. It is Moorthy who gives hands and feet to Gandhiji's ideal of Satyagraha. Even the other characters who come under the sphere of his influence try to uphold the Gandhian ideal in theory and practice. The Skeffington Coffee Estate becomes a hotbed of politics where the pattern of British oppression recurs in the literary carpet of Kanthapura. *Kanthapura* is a unique novel in which Rao exploits the elements of the romance, the epic and the symbolism of the feeble. The ten turbulent years of national history resonate across the pages of the novel beginning with Gandhiji's renowned Dandi March during the Salt Satyagraha and culminating in the Civil Disobedience Movement. By virtue of it being a *Sthala Purana* it recapitulates the legendary exploits of Rama and Krishna, the two incarnations of Lord Narayana who occupy lofty positions in the synod of mythological gods. Rao manages to integrate broad Indian experience and Gandhian philosophy in the novel, *Kanthapura*:

The three levels of action in the novel, political, social and religious are all related to unified concept of India both as a tradition and as a living culture as a magnificent past to be rediscovered in the enormous present. (*The Fiction of Raja Rao*, p. 49)

The unruffled and placid life of the people in the village of Kanthapura is disturbed when Moorthy underscores the importance of the Satyagraha Movement in their lives. The people of Kanthapura rend the skies with their slogans, '*Vande Mataram*', '*Mahatma Gandhi ki Jai*'

and 'Inquilab Jindabad'. Moorthy encourages the people to boycott foreign clothes and don swadeshi khaddar. He distributes free spinning wheels to the villagers so that they can spin cotton yarn. By exhorting people of all faiths to take to spinning and by emphasizing the fact that the Mahatma spins for two hours every day and likens it to a prayer, Moorthy raises the practice of spinning to the pedestal of a religious ritual.

It is through the *Hari Katha* that Gandhiji's religion of humanity is expatiated in the novel. Jayaramachar is the Hari Katha man. As he narrates his story, he weaves the Gandhian teachings into his narrative. He makes use of the Siva- Parvati story to explain the functioning of Gandhiji. When Jayaramachar likens Siva, the three-eyed god to three eyed Swaraj, we appreciate Rao's unique manner of showing Gandhiji's religion of humanity at work. Swaraj, in the opinion of Jayaramachar, contains the universal message of Gandhiji: Self-Purification, Hindu-Muslim unity and Khaddar. Jayaramachar first recalls the glorious past of India and the celebrated kings of Indian history as Chandragupta, Ashoka, Vikramaditya and Akbar. In the same breath he extols the sages as Krishna, Buddha, Shankara and Ramanuja. Then in a rueful manner he narrates how the land guarded by the Himalayas and watered by the Ganges and Cauvery is enslaved by the red-skinned British. The rishis implore Brahma to do something miraculous to rid the nation of foreign tyranny. The god showers his blessings, and therefore, the birth of Mohandas Karamchand Gandhi in a family in Gujarat can be attributed to the blessings of the gods. Gandhiji has waged a relentless battle against the serpent of foreign regime. Jayaramachar is sanguine that the time is not too distant for Gandhiji to bring Swaraj to India. It may be divined that the story of Gandhiji's birth and life is an allegory of India's struggle for freedom.

Apart from the Siva myth, Jayaramachar makes deft use of the Krishna myth to extol the achievements of Gandhiji in the freedom struggle. In the first case, he likens Gandhiji to Krishna who will slay the serpent 'Kalia' (the British rulers). Jayaramachar equates Gandhiji's teachings to Moorthy to those of Lord Krishna's teachings to Arjuna in Bhagvadgita. Just as Lord Krishna inspired Krishna to take cudgels against his sworn enemies, the Kauravas, similarly, Gandhiji inspired Moorthy to show passive opposition to his bête noir, the British. Rao's use of myths heightens the parallelisms and contrasts in the novel. As *Kanthapura* limpidly draws to its finale, Rao institutes a parallel between the myth of Ramarajaya and Gandhiji's call for Swaraj. Gandhiji, in a state of exile in London is like India (Sita) trying to wrest back Sita from the tyrannical yoke of the British (Ravana). Jawahar Lal Nehru (Brother Bharata) anxiously awaits the return of Rama after the Second Round Table Conference.

Rao's mythical technique in *Kanthapura* deserves accolades. Though Rao has made use of the political background to use his own myths yet they have an archetypal significance. By making fresh myths on the life of Gandhiji and by dovetailing them to the legend of Rama and Krishna with which the common people can identify themselves, Rao succeeds admirably in throwing into bold relief Gandhiji's religion of humanity.

Gandhiji's religion of humanity is felt by members of all castes and creeds and even many Muslims wholeheartedly appreciate his philosophy of communal harmony and idea of secularism. A Muslim figure in Khushwant Singh's, *Train to Pakistan* speaks highly of Gandhiji's religion of humanity and the universality of his appeal: "If we have no faith in God

then we are like animals”, said the Muslim gravely. "Look at Gandhi! I hear he reads the Koran Sharif and the Unjeel along his Vedas and Shastras. People sing his praise in the four corners of the earth. I have seen a picture in a newspaper of Gandhiji's prayer meeting. It showed a lot of white men and women sitting cross-legged. One white girl had her eyes shut. They said she was the Big Lord's daughter. You see Meet Singh, even the English respect a man of religion." (*Train to Pakistan*, p. 63)

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## **BOOK REVIEW**

*Review By Annavajhula J.C. Bose\**

**(I)**

**ECONOMICS: THE USER'S GUIDE**

**AUTHOR: Ha-Joon Chang**

**Pelican, Penguin India, 2014, pp.503(PB)**

**Price: INR 399.**

**(II)**

**ECONOMICS AND ITS STORIES**

**AUTHOR: Amal Sanyal**

**Social Science Press, New Delhi, 2012, pp.332(HB)**

**Price INR 650.**

**(III)**

**ECONOMICS FOR HUMANS**

**AUTHOR: Julie Nelson**

**The University of Chicago Press, Chicago and London, 2006, pp.154( HB)**

**Price \$ 16.00**

Three wonderful books are considered here, which we refer by the authors' names—Chang, Sanyal and Nelson respectively, and everyone who cares about economics in particular and social science in general must read them.

They take stock of the subject of economics, and are most essential readings for any beginner- student who wants to be persistently motivated to pursue the subject of economics in a chaotic and entropic world. Or, to put it differently in an evolutionary perspective, if we

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have the goal of living in a better world that is populated with people all of whom have a house, enough to eat, access to water, power, health care and education, and live with dignity by earning all this with their own factor income, then how can the subject of economics serve this goal? The three books reviewed here address the issues in this connection, and so are very topical to be studied in order to reinvent *economics for everyone*, and not just for that *one percent*, as the Occupy Wall Street movement slogan runs.

Nelson basically argues that the idea that economic systems are inanimate machines operating according to amoral laws is a religious belief, not a fact. And this belief has harmful effects—for life on the planet, for human society, and for everyone in particular. The way out of this is to understand that economies are vital, living, human-made, and shaped by our ethical choices, which will help to improve our decisions—both individually and as a society. In other words, the rightwing pro-business, neoliberal zealots firmly believe that the economy is a machine. They assert that any direct concern with ethics or care is unnecessary because a market economy automatically serves the common good. Similarly, the leftwing anti-market critics also believe the economy is a machine. They assert that ethics and care are impossible within capitalism since the system automatically runs on the energy of self-interest and greed. Either way, the metaphor forces us to divorce the “body” concerns of economic provisioning for our lives from the “soul” concerns of social responsibility and caring relationships. The “*economy as a machine*” metaphor has blinded us to the real world qualities that make humans work and care and organizations run. A new progressive pragmatism, that is neither leftist nor rightist but taking inspiration from the work of, say, the great J. R. Commons, is required to bringing and keeping body and soul areas of our lives together in order to create a better world.

“What are the greatest causes of harm in today’s society?” and “How can we work together to correct them?” are the right questions to ask now, according to Nelson. She is very skeptical about mainstream scholars in the social sciences and philosophy to answer these questions by leading the way toward a more adequate understanding of the relations among economics, ethics and care. However, she hopes that, over time, more scholars and popular writers will support this project, thereby shifting the public opinion toward a new and more responsible view.

According to Chang, economics does not need to be a difficult subject as it is made out to be in classrooms if it is explained in plain terms. In fact, 95 percent of economics is common sense—made to look difficult with the use of jargons and mathematics. Economics is, after all, nothing but a political argument. It is not and can never be a science; there are no objective truths in economics that can be established independently of political and frequently moral judgements. Therefore every economic argument should be evaluated in terms of “who benefits”. The political nature of an economic argument can discern sometimes the questionable assumptions underlying it that blatantly favour certain groups. In other situations, an argument may favour certain people unintentionally. There is no single economic way of thinking. There are at least nine different schools of economics, each with its strengths and weaknesses—the Classical School, the Neoclassical School, the Marxist School, the Developmentalist School, the Austrian School, the (Neo-)Schumpeterian School, the Keynesian School, the Institutionalist School (Old and New?), and the Behaviouralist School. No single school



can be totally depended upon and moreover, we will need to have an array of different tools available for different tasks. History testifies to the reality that too many lives have been ruined by people with excessive conviction in their own views. Further, while we need numbers to be able to get the sense of magnitude of our economic world and monitor how it changes, we just should not accept them unthinkingly.

This is not all. Much of economics these days is about the market. But the market is only one of many different ways of organizing the economy—indeed, it accounts for only a small part of the economy. The focus on the market has, thus, made most economists neglect vast areas of our economic life, with significant negative consequences for our well-being. The neglect of production at the expense of exchange has made policy makers in some countries overtly complacent about the decline of their manufacturing industries. The view of individuals as consumers, rather than producers, has led to the neglect of issues such as the quality of work and work-life balance. A good economy or a good society cannot be built if we do not look at the vast expanse beyond the market. As such, professional economists and other experts should not be trusted; they should be challenged, which will be a foundation of democracy.

Lastly, it is indeed difficult to change economic reality. The difficulty of changing the status quo, even when most people agree that it is only serving the interests of a tiny minority, is manifest nowhere as clearly as in the limited reform that has been made to our current neo-liberal economic policies even after the 2008 financial crisis has clearly shown their limitations. Sometimes the difficulty is due to the active attempts by those who benefit from the current arrangements to defend their positions through lobbying, media propaganda, bribing and even violence. The ‘one-dollar-one-vote’ rule of the market also drastically constrains the ability of those with less money to refuse undesirable options given to them by the underlying distribution of income and wealth. Furthermore, we can be susceptible to beliefs that go against our own interests. This tendency makes many losers from the current system defend it. Despite these difficulties, the fight to create an economy that is more dynamic, more stable, more equitable and more environmentally sustainable than what we have had for the last three decades, must go on. This requires people making efforts to become active economic citizens. In the long run, when enough people fight for desirable changes, many impossible things do happen. History testifies to this.

Sanyal is by far the most absorbing story teller. He tells us the basics of the subject of economics by surveying three broad groups of ideas—the Classical group, the Socialist group including the Marxists, and the Keynes and his followers group—without getting opinionated or taking sides.

The classical group developed the *Laissez Faire* view based on competitive markets as an efficient mechanism of allocating scarce resources to producers to produce what people want. The neoclassical economists, on this basis, realized that markets fail from several other reasons apart from monopoly and imperfect competition that the Classics pointed out, for example, externalities and public goods. They agree that the government has to act to get the outcomes closer to optimality in these situations. This is also the view of contemporary supporters of market liberalization. They suggest the following do's for the government: (i) markets should be kept competitive and contestable; (ii) anti-competitive and restrictive practices should

be curbed; (iii) externalities should be tackled through setting up missing markets; and (iv) the government should provide for public goods, but contract out their production to private producers, operating in contestable markets. On the macroeconomic side, they prefer supply-side policy to demand management.

The socialists believe that capitalism is a contradictory mechanism and on top of it, is grossly unfair to the majority of population. To keep it going, capitalists have to seek higher profit all the time. But that reduces the relative buying power of those whose income comes from sources other than profit. To sell the growing output of a capitalist economy, therefore, becomes increasingly difficult. They believe that this will produce recurrent crises in the capitalist order and weaken it to a point where other forms of social organization like socialism are possible.

The Keynesians, the third group, agree that capitalism has a problem of selling its output. Demand coming from consumption cannot buy all the output of an economy. So the rest has to be absorbed by the demand arising in business. But there is no necessary reason for this to happen. Business demand is temperamental depending, as it does, on expectations and fears. When it is inadequate, it is not possible to increase it just by cutting down interest rates. Investment responds to interest rate, no doubt. But the response is rather feeble, and more so in bad times. The Keynesians differ with the Marxists in their prescription as to how to overcome this problem. They do not think that private property and the market system have to be abolished to cure the problem. Private initiative, they think, is of paramount importance as it provides the incentive for progress. Their prescription for demand problem is that governments should make up the shortfall.

Now the most interesting part of Sanyal's story telling follows. None of the above three strands of economics has become obsolete. Like in the past there are believers and followers who confront one another's position and often with intolerance. However, there seems to be a subtle difference compared with the days before the 1990s. An increasing number of people reveal that they do not think of these ideas as inviolable truths and think of them as all partly true. Those who act and decide, for example, business companies, workers, farmers, bureaucrats, and politicians, have become fairly eclectic, much more depending on the issue and the situation. They might demand hands off in one situation and intervention in another. They appreciate the features of modern capitalism as often as they criticize them. The idea that only one view can be true seems to be surviving more among specialists and ideologues even as policy regimes in democratic countries have lost the rigid left-right stance and have become more flexible and eclectic.

A central point of Sanyal is that there are three sets of issues now in the face of which the above three sets of ideas have surely lost some relevance. These ideas may not throw as much light on the present economic system as they do on the last two and a half centuries.

The first set of issues relate to the intense globalization of recent times. The breakdown of the Soviet state, end of the Cold War, opening up of China and the rise of the emerging economies have transformed the world economy and global equations. The resulting environment and enhanced global trade, investment and migration raise new issues that are

now central. They relate to the effects of cross-border capital flow, production and investment by multinational enterprises, and increased migration. Capital flow—as portfolio and direct investment—and multinationals’ market domination raise a number of questions. Countries, particularly smaller ones, have complained that their economic sovereignty is undermined; tax system compromised, domestic industries side-stepped, and workers subjected to exploitation by large overseas employers. Richer countries feel that their national culture is under threat from immigration and that their welfare system is undermined if not abused. On the other side, poor countries despair at brain drain and complain of exploitation of their less skilled emigrants in overseas labour markets. All this conveys the need for sorting out the frictions arising from market and non-market interactions due to the growing intensity of globalization by creating appropriate institutions (social rules).

The second set of issues arises from the awesome scale of production and its demand for primary resources. The stress on natural environment is now many times more than ever, and we may very well be operating close to a threshold of catastrophe. The solution to this problem lies in promoting sustainable production and growth—a trajectory that can be maintained without reducing our stock of environmental assets.

The third set of issues concern abolition of absolute poverty. Socialism as a solution is questionable. The experience of the former Soviet bloc has introduced doubts about the viability of Soviet-type political systems even if they could be established. Because of the one party rule, socialist governments were insulated from public opinion. They came to be dominated by party cliques making the social base of the government even smaller. Lack of systemic checks and balances that characterized democracy meant that there was no corrective mechanism. The only course left to the people to correct the course was to rebel and bring the governments down. Also it is not clear if all countries of the Soviet bloc had indeed succeeded in eradicating absolute poverty. As such, we will have to find solutions within the political and economic structure in which we would live in the foreseeable future. In the short run, action against poverty takes the form of transfer of purchasing power to those who are desperately poor. And in the long run, we have to find ways of creating jobs and income earning assets, which are easier, said than done.

All in all, Sanyal, Chang, and Nelson have done a great service to the academic community through these popular writings by way of not only inspiring the students of economics but also in throwing light on the relevance of economics in our times. These writers know how to demystify technical terminology and go to the heart of the matter. More of this kind of writing is required to be studied more and more now to increase the number of non-dogmatic and responsible economic citizens in the world so that the cumulative effect may be salutary to bringing about a better world!

## BOOK REVIEW

*Review By Rigzin Chodon\**

### HIMALAYAN BRIDGE

**EDITORS: Niraj Kumar, George van Driem and Phunchok Stobdan**

**KW PUBLISHERS, NEW DELHI 2016, pp. 441(PB)**

**Price: INR 1180.**

Living up to its title, the book—*Himalayan Bridge*, is a rich and a refreshing collection of twenty four scholarly papers presenting an array of study, ranging from geology, history, politics, philosophy, art, culture in a broader spectrum along with detailed study of spirituality, language, Himalayan food culture, border study, identity politics, education, ethics, religion, study of murals, dance forms to mysticism.

The editors of the book, Niraj Kumar, George van Driem and Phunchok Stobdan are experts in their respective fields of Asian Studies, linguistics and geopolitics. They have been able to present to their reader, a succinct and a well covered text encouraging young scholars and interested Asian enthusiasts to venture into new paradigms of understanding the Himalayas.

The book has been divided into five major parts which are then carefully categorized under the following topics—Himalayas: Geology, Genetics, Identity; Prism of the Past; Mosaic of Politics; Philosophy, Art and Culture and Spiritual Odyssey. Informative papers in each section help the reader to explore and better understand the Himalayas.

The first section focuses on papers related to geological, genetic and identity aspect of the Himalayas; Prof A.K. Jain, explores the geological and geochronological data from the Northern parts of the Himalaya and Trans-Himalaya mountains with data references to state how these mountains did not initially evolve by the collision of continents of the Indian and Asian plates. Uttam Kumar Shinha discusses the critical players—China and India, in the hydropolitics of the region. The author focuses on China, the world's most independent riparian country and its hydrological position in shaping larger political equations with its riparian neighbours. George van Driem, a renowned linguist revokes the fascinating modern discourse of how “Scientific” racism prevails in the myths of Mongoloid race and the Sino-Tibetan language family tree. He states that both myths must be abandoned. He draws our attention

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towards the false “Sino” theories, founded upon methodologically flawed comparisons, historical explanations with inadequate knowledge of Trans-Himalayan languages. Thereby, leading the readers towards the prehistoric understanding of the early Holocene episodes that led to the ethnolinguistic phyllogeography, observed in eastern Eurasia and Oceania today. The author also focuses on the basis of ethnolinguistic prehistory, supporting evidences that our ancestors emerged from Africa on their way to East Asia, Southeast Asia, Oceania, Siberia, the Americas and even Lapland, whence many first passed through the Eastern Himalaya and crossed the Brahmaputra. Thus creating a cradle for ethnogenesis of various Uralo-Siberian and East Asian language families that can be traced even today.

While on the other hand, Niraj Kumar and co-author Chingngaih Biak’s paper induces an interesting study of entire Himalayan belt inhabited by the Tibeto-Burman speaking people (Trans Himalayan) using the concept of Nomadia (concept used by French philosopher Deleuze & Guattari) along with an introduction of the concept of Zomia. The authors extend their study further by intricately talking about the idea of how textile can be read as texts and how new Textile Tree can be created to discover the connectivity among various migrating communities in Asian regions. These regions have been divided into four culture bands—Kang, Kanji, Karma and Koran, from east to west respectively, with the major focus on the textile of the Nagas from the Kang culture.

The second section titled, the ‘*Prism of the Past*’, includes papers ranging from the use of different terms for the Himalaya. These terms are reflected by the author, Krishna K Mandal, who cites the terms used in the Ancient Indian Texts like—the Vedas, the Ramayana, Mahabharata, Arthashastra, Jatakas, *Atanatiya Sutta*, *Rajatrangini*, the Puranas, etc. making the readers revisit the historic importance of the Himalayas in different contexts like local traditions, religious, linguistic and historic. The author demonstrates how the use of different names for the Himalayas created a sacred presence of an Indian imagination for millennia.

Claude Arpi, discusses Nehru’s philosophy of NEFA. His paper highlights the chronicles of some of the IFAS officials who served in Tibet as well as Gangtok. The NEFA civil services and the Indian Frontier Administrative Services and their experiences have been discussed in his paper. Glenn Mullin, an authority on the Kalachakra tradition, traces the efforts of Himalayan Buddhist lamas in rebuilding their variant of Buddhism in the western culture and at the same time actively engaging in the rebuilding of their institutions back in Tibet after ‘The Cultural Revolution’ in China destroyed most of the monasteries in Tibet.

The third part of the text focuses on politics in the Himalayan belt with seven papers to the reader’s disposal. Phunchok Stobdan articulates the discussion on trans-Himalayan geopolitics in his paper. He argues that Western Science cartography represents a distorted reality of the conceptual circle of unity and infinite relations, in a cosmic sense under the Mandala thought in the context of Asia. He states that tools of cartography have pierced through borderlands and frontiers that tend to split nationalities, societies and ethnicities. With the flow of culture, social and economic interdependency in time, the cartography borders have often become illogical. He argues that the Asian paradigm of political order for Trans-Himalayas should be implemented to thwart radicalization of the Himalayas in changing the geopolitical landscape, keeping India and China in mind. Namrata Goswami, discusses the flow of drugs and arms in

the Eastern Himalayan region i.e. Northeast India. The paper identifies the sources of these illegal trade as well as the linking areas with the help of extensive mapping. Goswami also deliberates on China's presence especially in Myanmar and the former's engagement with some of the ethnic Myanmar groups and its impact on Northeast India. Bhutanese scholar Dorji Thinley, ascertains the concept of GNH (Gross National Happiness) of Bhutan and highlights the interaction of culture and education in Bhutanese schools by stating the government policy of recognising teachers and children as the custodians of culture and catalysts of cultural transmissions.

The fourth section of the book is an interesting mix of papers on Philosophy, art and culture. Dorji Damdul, Director of the Tibet House, New Delhi has aptly discussed the great Nalanda tradition of monastic study as a university that flourished from the 1<sup>st</sup> to the 13<sup>th</sup> century by introducing to its readers the glorious intellectual heritage of various fields of study like philosophy. His Holiness Gyalwang Drukpa, has in a very short but succinct paper discussed the legacy of the saint Naropa (956 A.D- 1050 A.D.), an accomplished disciple of Tilopa. The sites of Kashmir like the Jama Masjid in downtown in Srinagar used to be a huge monastery where Naropa gave teachings to over ten thousand people. The author has introduced its readers to the ancient sites of Buddhist saints, from the Drukpa Kagyu school of Buddhism in relation to the present Islamic places of worship.

Pema Dorjee, a Tibetan physician writes about the Tibetan medicine system called the 'Sowa Rigpa' meaning 'the science of healing', practiced in the Himalayan region in a nutshell. This was his last piece before he succumbed to an untimely death. Famous food researcher, Jyoti Prakash Tamang based in Sikkim elaborates upon Himalayan food in the region ranging from India to Nepal, Bhutan and Tibet Autonomous Region in China have been discussed with several tables enlisting food items including fermented food.

In the same lines, Geetika Kaw Kher looks at the Alchi monastic complex in Central Ladakh, as an amalgamation of a unique and vibrant art form. Sinam Basu Singh, goes on to discuss the Manipuri dance, a major classical dance form in South Asia. He discusses the Manipuri dance, called the Lai-Haroaba which was a Pre-Vaishnavite traditional festival and with the advent of Hinduism, the Post-Vaishnavite period began with a new era for the dances and music in Manipur. The last section of the text takes the reader on a Spiritual Odyssey, first to Rishikesh then to the Himalayas, the sacred abode of Gods. Swami Paranand Tirth has described the mythological significance of few Himalayan peaks on the Indian side from an esoteric and exoteric perspective while keeping in mind the sacredness it has for religions like Hinduism, Buddhism, Jainism and Sikhism.

The book tries to cover a whole range of studies of the Himalaya and helps the reader to see it in different light altogether. And hence, becomes an essential text to understand different contexts of the Himalaya for anyone pursuing studies or formulating policies related to the Himalayan region.



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