



US Land-Grant Universities in India: Assessing the consequences of agricultural partnership, 1952–1972



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ABSTRACT

India has been an agrarian economy since ancient times and the science and art of agriculture, animal husbandry, soil management and irrigation have richly evolved through the course of its history. The present study illustrates the ways in which these were impacted by the colonization of the country, the subsequent Independence in 1947 amid the complex environment of the Cold War and India's policy of Non-Alignment. Amid a difficult socio-economic situation enraged by the famines and food insecurity in India and the simultaneous Four Point Program of the then President of the United States, Harry S. Truman, there emerged a consensus between the two countries to improve the living standards, eliminate hunger, encourage education in food production, food handling, food utilization and hence development in India with the help of Land-Grant Universities, by creating similar education centers in India. This study of Indo-American partnership in agricultural education, research and extension through the also incorporates a discussion of the extraordinary role of the Ford and Rockefeller foundations as well as that of CIMMYT (International Maize and Wheat Improvement Center), IRRI (International Rice Research Institute) and ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), whose joint efforts with Indian scientists helped build solid foundations for agricultural universities in India, attain self-sufficiency in food grain production and proved to be the harbinger of a new era of Indo-US relations through the Green Revolution.

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Abbreviations: AID, Agency for International Development; APAU, Andhra Pradesh Agricultural University; APP, Agricultural Production Program; APLU, Association of Public and Land-grant Universities; CIMMYT, Centro Internacional de Mejoramiento de Maíz y Trigo or International Maize and Wheat Improvement Center; CRRI, Central Rice Research Institute; CUSURDI, Council of United States Universities for Rural Development in India; FOA, Foreign Operations Administration; FYP, Five-Year Plan; HAU, Haryana Agricultural University; HYV, High-Yielding Variety; IADP, Intensive Agricultural District Program; IARI, Indian Agricultural Research Institute; ICAR, Indian Council of Agricultural Research; ICRISAT, International Crops Research Institute for the Semi-Arid Tropics; IRRI, International Rice Research Institute; JNKVV, Jawaharlal Nehru Krishi Vishwa Vidyalyaya; KSU, Kansas State University; LG/LGU, Land-Grant/ Land-Grant University; MU, University of Missouri; MUAS, Mysore University of Agricultural Sciences; MPKV, Mahatma Phule Krishi Vidyapeeth; OSU, Ohio State University; OUAT, Orissa University of Agricultural Technology; PAR, Project Appraisal Report.

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1. Background

India has been an agrarian economy since ancient times. Agriculture, animal husbandry, soil management and irrigation were accorded the highest importance, as is evidenced by the excavations of Harappa and Mohan-jo-Daro, and the study of the Vedas, the Upanishads, the epic mythologies including the Ramayana and Mahabharata, and throughout the rule of various kingdoms and dynasties in the ancient and medieval India.

A short history of India's rich agricultural heritage can be summarized as follows:

As early as the 3000–1500 BCE, during the Indus Valley Civilization, the netizens accorded importance to food security. It is evident from the granaries, bullocks and wheeled carts that were found to have existed. The Vedic period (1500 BCE–600 BCE) revealed interesting facts like the domestication and farming of rice, barley, oats, and wheat and legumes as well as the expansion of hunting, gradual mastery in metallurgy for ploughing and irrigation. A hymn in the Atharva Veda devoted to Goddess Prithvi (Earth), reads thus “O Mother, with your oceans, rivers, and other bodies of water, you give us land to grow grains, on which our

survival depends' and 'May you, our motherland on whom grow wheat, rice and barley . . . be nourished by the cloud and loved by the rain' (Dwivedi and Tiwari, 1987). The Buddhist period of 600 BCE witnessed the expansion of cultivation and domestication of animals throughout north and northeast India. Jainism with its basic tenet of 'Ahimsa' or non-violence considered Jeeva (life) in every plant and animal and the earth. In the ancient Hindu texts of Ramayana and the Mahabharata (500–400 BCE), agriculture was mentioned to be the way of life of the people, and efforts were made to ensure the prosperity of the farmers and happiness of the people (Guruge, 1991).

India's most articulate treatise on good governance 'Arthashastra' was written during the rule of the Magadh Empire, by Chanakya- the prime minister of King Chandragupta Maurya. This treatise among various points of governance underscored the importance of agriculture upon the economy. To take proper initiatives for the practice of agriculture a separate post of Head of Agriculture or *Sitadhakasha* was created. The comprehensive vocation of agriculture, cattle breeding and trade into a science was called *varta* (Trautmann, 2006, p. 56–57). King Asoka, promoted horticulture and arboriculture (Puri, 1968). This period () was a testimony to the provisions for well-developed agriculture techniques (Basham, 1954, p196; Sun Staff, 2013).

The ancient centers of learning, namely Nalanda and Taxila were established during 500 BC500 BCE to 300 CE. During this time, Maharishi Parashara authored the *Krishi Parashara*, and is regarded as the highest authority of agriculture, dealt with knowledge and practices relating to soil classification, land use, manuring, plant protection and agricultural meteorology.

Various dynasties like the Sungas, the Satvahanas, the Kushanas and the Guptas ruled India during 200 BCE to . Every ruler conscientiously promoted agricultural economy (Puri, 1968). During this time iron implements for agriculture were further improved. The art of transplanting rice seedlings was widely practiced along the Krishna and the Godavari river deltas, which eventually became the rice bowl of India. The Kushanas contributed to the construction of brick-lined wells considered to be an agricultural innovation for continued irrigation. South India was ruled by the Pandyas, Cheras and Cholas who considered agricultural development as their primary duty and worked towards maintaining soil fertility and irrigation facilities as the country's assets. They believed that stability of a kingdom was ensured not by the army but by agriculture and sufficient crop production (Basham, 1954).

During the reign of the Chalukyas, Rashtrakutas, Pallavas, Pandyas, Hoyasalas and the Kakatiyas (from 535 to 1300 AD1300 CE) there was further expansion of irrigation and agricultural and forest produce were exported. The Kashyapa priests believed that both bipeds and quadrupeds on the face of the earth would face misery if there were no cultivation, and hence for pleasing the gods and protecting the people, the king should take personal interest in agriculture (Randhawa, 1980).

These were further developed in the Mughal period. Emperor Akbar introduced the *Ain- i- Dahsala* system to make the land revenue system more organized. A center of Sericulture was established in Bengal for silk handlooms and sandalwood, saffron (especially during the reign of Jahangir), almonds, cardamom were grown for exports. Shahjahan introduced the methods of grafting for fruits like oranges and mangoes (Kumari, 2012). However, the prevalence of Zamindari system led to meagre incomes for the peasantry (Habib, 1969, p 38). Overall the Mughal–Indian economy was a system of direct agrarian exploitation by a small ruling class (Wills, 2005). From 1750–1798, the British East India Company seized power from the Mughals (Embree, 2006, p180). Lord Cornwallis, who was defeated in the US and appointed in India, formally instituted the establishment of a revenue system for the

collection of taxes on agricultural land, the major source of revenue, commonly called the Zamindari System.¹ In 1858 CE, India was placed under the direct rule of the Queen. Because of the industrial revolution in England, there was enormous demand for agricultural raw materials, and India was transformed from a self-sufficient agricultural economy to a supplier of cheap raw materials, mainly cotton and indigo for British industries.

Confronted by massive famines, Lord Curzon (Viceroy of India from 1899– 1905 CE) realized that the government must give a high priority to the development of agricultural research and development (Randhawa, 1980), and ordered the construction of new irrigation works, and to encourage agriculture and industry (Embree, 2006, p 279). As a result, an Agricultural Research Institute each at Pusa (Bihar) and Coimbatore (Tamil Nadu) were established in 1905 (<http://www.pusavarsity.org.in>). Agricultural Colleges were also established at Kanpur, Lyalpur (now in Pakistan and called Faisalabad) and Nagpur in 1906, Poona in 1907 and Sabour in 1908. On the recommendations of the Royal Commission on Agriculture (1928), Imperial (now Indian) Council of Agricultural Research was created in 1929 to provide further impetus and support to the already existing Agricultural Research Institutes.

With the prevailing systems of Zamindari, Ryotwari² and the Mahalwari³ in place to ensure a fixed income to the government, the cultivators were left at the mercy of the middle-men, as extortions continued despite failure of monsoons. In 1934, amid rapidly growing struggle for freedom, Rao Bahadur Chotu Ram of Rohtak as the revenue minister in the provincial government in 1934 attempted to create a non-sectarian peasant group consciousness, and contributed to the enactment of two agrarian laws, namely, the Punjab Relief Indebtedness Act in 1934 and the Punjab Debtor's Protection Act in 1936, which emancipated the peasants from the clutches of the moneylenders and restored the right of land to the tiller. His legacy continued with the establishment of agricultural research facilities at Lyallpur College of Agriculture and Research, which in the coming decades would develop many high yielding varieties of wheat, barley, rice and pulses which increased the yield at farmer's fields bringing prosperity to the peasantry (Kadyan, 2009). Under the able leadership of Rao Bahadur Dr. Ram Dhan Singh, a plant breeder, developed the wheat varieties Pb-518 and Pb-591 in 1933–34. Pb-591 was a disease resistant, good yielder and bold shining grains with excellent bread (chapatti) making characteristics and fetched a premium price over other wheat varieties. He was a pioneer in establishing a modern milling and baking laboratory for the first time in India. He also developed outstanding varieties of rice, especially Basmati-370, that eventually made India the owner of Basmati germplasm. He developed improved varieties of barley and moong pulses that suited to limited irrigation conditions (<http://www.drramdhan-singh.org/biography>).

Even though only modest attempts were made to promote agricultural technology, Sir Albert Howard, agricultural adviser to the British government in Indore believed that 'the health of soil, plant, animal and human is one and indivisible'. He was committed to developing farming methods that the average Indian farmer

¹ The Zamindars in the provinces of Bengal, Bihar, Orissa were recognized as owner of the lands and were had the right to collect land from the peasants, where the realized amount would be divided into 11 parts, with one-part belonging to the Zamindars and the remaining ten-parts to the East India Company.

² In the Madras, Bombay, parts of Assam and Coorgh provinces, the ownership rights were handed over to the peasants from whom the taxes were directly collected by the British. The revenue rates of Ryotwari System were 50% for the dryland areas and 60% for the irrigated land.

³ It was introduced in Central Province, North-West Frontier provinces and Punjab, where the land was divided into Mahals. Each Mahal comprised of one or more villages and the land ownership rights were vested with the peasants. The village committee was responsible for collection of the taxes.

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