

Employment Generation in Agriculture: A Special Reference to Coconut Cultivation in India

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In Indian context, development of agriculture is critically important for ensuring food and nutritional security for the millions of people that still live below the poverty line. The agriculture growth is required for raising rural incomes and generating employment opportunities, and for stimulating industrialization and overall economic development of the country. Out of the rural labour force of roughly 300 million in India, 72.7% still earns a living from agriculture. Out of those who are in agriculture, about two-thirds (64%) are self-employed, that is, they are farmers. The remaining one-third (36%) are wage workers, almost invariably on casual basis. Near about 44.8% of land-holdings are sub-marginal (0.01-0.40 hectares), 18.7% are marginal (0.41 to 1 hectare) and 12.2% are small (between 1 and 2 hectares). This kind of smallholder agriculture cannot exploit economies of scale and scope and is subsistence-level, inefficient and relatively unproductive. For development to happen there must be a graduating out and a movement up the value chain of productivity. Public sector gross capital formation in agriculture used to be 5% of the gross value of agricultural output in the early 1980s, but declined to 2% in the second half of the 1990s (India Labour Report, 2008). This occurred because of fiscal constraints, both at the central and state levels and has inched up to 3.7% in 2006-07. Private sector gross capital formation in agriculture has also increased from 5.5% in the early 1980s to 8.9% in 2006-07. But often, private investments require public investments to perform a catalytic function.

There is hardly any increase of agricultural employment during the 90s (1994-2000), while employment in certain sub-sectors of agriculture like livestock, forestry and fishing has in fact, declined. There are mixed trends from the states. Thus employment in agriculture has declined in many states, while in certain states, where the employment increased, the trends are not necessarily encouraging. On the other hand labour productivity in agriculture has increased; this increase is associated with almost a complete decline of agricultural employment in the 1990s (Brajesh Jha, 2006).

The real wages for agricultural workers has increased consistently during the 90s, though certain indices of agricultural productivity have not increased significantly, suggesting that increase of wage incommensurate with the increase in agricultural productivity and cannot be sustained for long. The fall in growth of agricultural employment has not been accompanied by a rise in employment opportunities in the non-agricultural sector. On the contrary, withdrawal of state support and reduction in state expenditure has made it difficult for the labour declared surplus in agriculture, to find alternative employment. In 1987–88, about 60 per cent of the regular non-agricultural employees in rural areas were employed by the government, often in employment generating programmes that created almost 80 per cent of the increments in such regular jobs during the 1980s (Sabyasachi Mitra, 2003).

The economic reforms package of the 1990s has seen declines in central government revenue expenditure on rural development, substantial declines in public infrastructure and energy investments that affect the rural areas, reduced transfers to state governments that have been facing a major financial crunch and have therefore been forced to cut back their own spending, particularly on social expenditure, and financial liberalization measures that have effectively reduced the availability of rural credit and raised input costs. The falling rate of growth of agricultural employment in India cannot be explained entirely by opportunities in the non-agricultural sector, or by growing participation in education. The macroeconomic strategy needs to be reoriented towards the basic goal of increasing productive employment opportunities in the rural areas. Changes in cropping pattern have also affected agricultural employment adversely. Not only has there been a shift in cultivation from food grains to commercial crops, horticulture and floriculture requiring less labour, many regions have simultaneously also witnessed a shift from crops providing year-round employment to crops that at best offer seasonal employment. With an increasing tendency to use labour-displacing technology in agriculture, use of expensive inputs, and a near non-availability of agricultural and other rural-credit facilities for the small farmers, the situation looks bleak for the small cultivators throughout the country.

With a not-so-encouraging state of affairs in agricultural employment, it is very pertinent to examine and illustrate opportunities for increasing employment in agriculture encompassing crop-based activities and also allied activities, and change from organization of production to processing and marketing as well. Most of these activities are in operation in selected pockets in the country; and their spread on a larger scale would however require favourable infrastructures, institutions and incentive structures. With this backdrop, in this chapter, it is attempted to illuminate the employment potentiality of Indian Coconut Sector.

Coconut in the National Economy

The coconut palm is venerated as *Kalpavriksha* – ‘the tree of life’ in Indian classics. Coconut palm is supreme in its versatility. More than fifty value added coconut products are traded internationally. India has emerged as the largest producer of coconut in the world with a production of 15840 million nuts in 2007 placing Indonesia and Philippines in the second and third positions respectively. In India, coconut is grown in an area of 1.94 million ha with a per hectare productivity of 8165 nuts. Coconut is mainly a crop of small and marginal farmers in India. Kerala is the leading coconut producer in the country with an annual production of 6054 million nuts, followed

by Tamilnadu who produces 5430 million nuts annually (CDB, 2007). Coconut production in the country has increased from 12678 million nuts during the year 2001 to 15840 million nuts in 2007 with 3.5 percent compound growth rate of production. Productivity also has shown an upward trend from 6952 nuts per hectare in 2001 to 8165 nuts in 2007. The compound growth rate of productivity was found to be 2.74 percent during the period. Coconut assumes considerable significance in the national economy in view of rural employment and income generation. Coconut industry provides livelihood to about ten million people in India. This sector contributes about Rs. 8000 crores per annum to the national GDP and earns about Rs 650 crores as foreign exchange. The traditional coconut industries which supports thousands of rural poor by providing employment and income are copra making, oil milling, coir making and to a certain extent desiccated coconut industry. The recent advances made in the field of product diversification and by product utilisation have opened new avenues of income and employment opportunities in coconut sector.

Coir Sector

The coir industry in India has a history and tradition, which dates back to the 19th century. One of the major traditional industries of India, coir provides livelihood to millions of artisans in rural areas. This industry took roots in India's southern states along the coastline. Being 100% natural, fungi resistant, bio-degradable and eco-friendly, today, coir has become an article of everyday use in modern life with a product range encompassing mattresses, matings, door mats, garden articles, etc. India is the largest coir producer in the world accounting for more than 80 per cent of the total world production of coir fibre. The coir sector in India is very diverse and involves households, co-operatives, NGOs, manufacturers and exporters. The coir industry employs more than 6.4 lakh persons of whom a majority is from rural areas belonging to the economically weaker sections of society. Nearly 80% of the coir workers in the fibre extraction and spinning sectors are women (MMSME, 2008). The State of Kerala also known as the "Land of Coconut" is the largest producer of coir in India. It accounts for more than 75 per cent of the total production. Coir industry in the state provides employment to around 4 lakh persons of which 3.25 lakh are women.

India accounts for more than two-thirds of the world production of coir and coir products. It is an important cottage industry contributing significantly to the economy. India is the largest producer and consumer of coir and coir products followed by Srilanka. Both India and Srilanka account for more than 90 per cent of the global production. Philippines, Thailand, and Vietnam are the other important producers of coir and coir products. In respect of international trade, India and Srilanka are the largest exporting countries. The export of coir and coir products from India has increased from 55,000 tonnes in the year 1999 to 200,000 tonnes in 2009 with a compound growth rate of 1.14 percent during the period.

The export demand in 2020 estimated at 786 thousand tonnes. The Cabinet Committee on Economic Affairs (CCEA) has approved Rs. 243 crore for coir project, which is expected to generate more than 60,000 jobs in dying coir sector (PIB, 2008). The highest ever central scheme for the coir sector was approved by the CCEA. The central scheme comprises two vital sectors that are at the lower most end of the coir manufacturing pyramid, the spinning and the tiny household segments. Around 4000 units of the spinning segment and 3200 units of the tiny and

household segment will be covered under the scheme. This scheme is expected to generate employment for more than 60,800 workers, which include 36,800 new jobs and 24,000 existing ones.

Coir pith is a by-product of coir industry which can be converted into environment friendly soil conditioner by composting for use in horticulture. Many units, including some of them managed by women self help groups, have come up in different parts of the country for the production and marketing of coir pith compost. A unit processing 10 tonnes of pith a day requires 10 persons for processing. If 50 per cent of the coir pith now being wasted is made use of for composting nearly 0.3 million people would get employment (Remany Gopalakrishnan, 2003).

Toddy Tapping and Processing

Tapping coconut trees for toddy is a traditional activity which can be made use of for enhancing income and employment in coconut sector. This practice is prevalent in many parts of the coconut belt in the country. The coconut farmers allow a few palms in a garden to be tapped by professional tappers on rental basis, which is based on each tree or on each spathe tapped. In India 0.25 millions of people belonging to the weaker sections of the society find their means of living from tapping and subsequent activities. Of this, 0.12 million are in Kerala. Usually the tapping period is six months and in some places it is allowed to be continued for one year or even more. Coconut farmers are of the opinion that toddy tapping and related processing for coconut sugar, vinegar, etc. when promoted as a cooperative endeavour will benefit both the farmers and tappers (Thampan, P.K.1999). Of late, technology for production of sweet toddy has been developed which has tremendous potential to be promoted as a health drink, especially when people are becoming more health conscious in the wake of reports on ill effects of artificial soft drinks available in the market.

Coconut Based Agribusiness

Agro-processing is now regarded as the sunrise sector of the Indian economy in view of its large potential for growth and likely socio economic impact specifically on employment and income generation. Some estimates suggest that in developed countries, up to 14 per cent of the total work force is engaged in agro-processing sector directly or indirectly. However, in India, only about 3 per cent of the work force finds employment in this sector revealing its underdeveloped state and vast untapped potential for employment. Properly developed, agro-processing sector can make India a major player at the global level for marketing and supply of processed food, feed and a wide range of other plant and animal products (Kachuru, 2007).

There exists a huge scope for coconut based agribusiness in India with reference to processing and value added products. The crop provides employment opportunities to more than 10 million people in the country. Agribusiness management on a mission mode approach aims for maximization of farmers' income, employment and sustainability. Technologies are available for individual processing for the production of snowball tender nut¹, coconut chips, copra, vinegar and desiccated coconut (DC)² Desiccated Coconut (DC) is the dehydrated disintegrated coconut kernel with <3 percent moisture content, coconut shell charcoal, packed tender nut water, coconut

cream and milk powder. The economics of production of coconut based value added products are furnished in Table 2.1 and 2.2, indicate fairly high level of capital requirement towards establishment and operation of these enterprises. For this, institutionalized credit may be arranged through developmental agencies especially. A huge amount of returns will, act as the motivating factor. Further coconut farmers are expected to realize better price stability in long run.

Table 2.1: Economic analysis of production of coconut based value added products

<i>Sl. No</i>	<i>Industry</i>	<i>Capacity (No of nuts/day)</i>	<i>Quantity of products</i>	<i>Investment (Rs Lakh)</i>	<i>Gross returns (Rs Lakh/year)</i>
1.	Snow Ball Tender Nut	500	500Nos	2	0.54
2.	Coconut Chips	500	75kg	3	27
3.	Coconut oil mill	10000	750kg	6	135
4.	Copra production	10000	1500kg	6	135
5.	Desiccated coconut	10000	1000kg	30	180
6.	Coconut vinegar	10000	1000kg	8	36
7.	Coconut shell powder	10000	1000kg	13	60
8.	Coconut shell charcoal	35000	1150kg	13	17
9.	Coconut cream	10000	2500kg	128	600
10.	Coconut milk powder	20000	1000kg	250	360
11.	Packed coconut water	12500	2500kg	32	75

Source: Sairam *et al.*, 2008

Large-scale integrated production of value added coconut products is a challenging business opportunity. Coconut based agro processing complex is a suggested long term investment with an initial expenditure of Rs 121 lakh for setting up processing units (including land and buildings) integrating copra, coconut oil, fibre, compost, shell powder, vinegar, desiccated powder and coconut chips for processing 25,000 nuts per day. Based on the initial availability of the capital few more components of these products can be integrated. Maximum investment is required for DC unit and the minimum for compost unit. A total number of 36,000 man days is required per year. The realized gross return of various integrated coconut processing models over edible oil industry alone varies from 19.05 percent to 98.4 percent. Such an integrated approach ensures better price stability for coconut and its products and stabilizes the gross farm income for coconut farmers. This would lead to better rate of adoption of technologies and the overall productivity of the coconut industry would increase. However, those who are willing to start these units on a large scale needs to understand the basics of international demand for diversified coconut products and the expected quality parameters at the international level.

Footnotes

¹ Snow ball tender nut is a globular tender kernel with water rich in nutrient content suited for eating and drinking

² Desiccated Coconut (DC) is the dehydrated disintegrated coconut kernel with <3 percent moisture content

Table 2.2: Economic analysis of coconut processing complexes

<i>Model No</i>	<i>Model</i>	<i>Initial investment (Lakh)</i>	<i>Manpower requirement</i>	<i>Returns/day (lakh)</i>	<i>%Increase of returns over edible oil</i>
I	Edible oil + DC powder + Chips + Vinegar + Shell powder + Oil extraction from testa + Fibre + compost	121	120	2.36	87.3
II	Edible oil + DC powder + Chips + Vinegar + Shell powder + Oil extraction from testa	90	108	2.03	61.1
III	DC powder + Chips + Vinegar + Shell powder + Oil extraction from testa	120	150	2.20	74.6
IV	Edible oil + Vinegar + Shell powder	36	40	1.45	15.08
V	DC powder + Vinegar + Shell powder + Oil extraction from testa	130	130	2.00	58.73
VI	Chips + Vinegar + Shell powder + Oil extraction from testa	105	180	2.50	98.41
VII	DC powder + Chips	95	145	1.70	34.92
VIII	Edible oil	18	35	1.26	

Source: Sairam *et al*, 2008

The Potential of Coconut Based Agribusiness in India

About 4000 of desiccated coconut is manufactured annually and consumed mainly by confectionery and biscuit industry. Taking into consideration the present day food consumption patterns and growth in confectionary industry in India (10–12%) the demand for desiccated coconut is likely to increase in coming years. On the other hand the domestic demand for activated carbon is estimated at 44930 / annum and the likely growth rate is 10 % per annum. The coconut shell charcoal is the main raw material required for the manufacture of activated carbon. Export of shell charcoal and activated carbon from India had earned \$25 million in foreign exchange in 2008. World demand for activated carbon is expected to grow at five per cent per year, touching 1.2 million by 2010. Studies highlight that the demand for coconut shell carbon in water purification will grow because of proposed stricter limits on the levels of Arsenic and Methyl tertiary butyl ether (MTBE). Thus, there is no dearth of opportunities in the value added coconut sector, which is challenging and demands excellent entrepreneurship.

Women Empowerment through Coconut Based Micro-enterprises

Production and marketing of diversified high-value coconut products from all parts of coconut—the kernel, husk, shell, wood, water and leaves; are a potential source of income and employment

for the rural women. The documentation of outputs of the project entitled “Developing sustainable coconut based income generating technologies in poor rural communities” implemented in eight Asia–Pacific countries including India by International Coconut Genetic Resources Network (COGENT) under IPGRI (at present Bioversity International) revealed that women members of the Community Based Organisations under the project increased their income by 3-5 times through the production and marketing of coconut high value products compared to their previous income from copra, securing for them a steady source of additional income and helping them rise above poverty line. Equally important, this project intervention provided employment opportunities to formerly unemployed and under employed rural women resulting in enhanced self esteem, and economic and social empowerment (Batugal and Oliver, 2005).

In India, there are many women’s self help groups promoted by State Poverty Alleviation Projects, *Panchayat Raj* Institutions and other agencies which are involved in managing coconut based micro enterprises. An analysis of such units supported by *Kudumbasree* Mission, the State Poverty Alleviation Project in Kerala, revealed that micro enterprises on shell charcoal, copra and coconut oil, toilet soap, washing soap, coconut based food products, coir yarn spinning, virgin coconut oil, etc. are the major types of enterprises and that *Kerasree* units by the women’s self help groups for the production and marketing of coconut oil ranked first with respect to the number of coconut based micro-enterprises. It has been observed that through these coconut-based micro enterprises women could derive benefits such as better self-esteem, self confidence and influencing power within the household, better social interaction and communication skills besides economic empowerment. Apart from the SHGs under *Kudumbasree* project, women’s groups organized under some special projects by other agencies also run coconut based micro-enterprises in Kerala. The success story of such a unit is furnished in Box 1.

Success Story of SUBICSHA

SUBICSHA (Sustainable Business Development of Innovative Coconut Based Microenterprises for Holistic Growth and Poverty Alleviation), is a special project under SGSY implemented by Perambra block panchayat in Kozhikode District in Kerala State since 2003. The three-pronged strategy adopted for the implementation of SUBICSHA includes i) Establishment of micro enterprises for production of various coconut based value added products, ii) Establishment of units for supporting the production enterprises to work as an integrated supply chain which includes procurement support, infrastructure management, marketing support and quality management and iii) Integrative mechanism for monitoring the chain of activities. The federation of women SHGs under SUBICSHA was registered as a producer company in 2007-08. At present there are 413 women Self Help Groups (SHGs) with a total of 5600 members are involved in various activities related to production and marketing of coconut products under SUBICSHA. About 26 value added coconut products are being produced and marketed by SUBICSHA. They include husk based products such as coir fibre, coir yarn, coir pith compost; coconut oil based products such as virgin coconut oil (VCO), edible oil, traditional VCO, hair oil, massage oil, bath soap; shell based products such as shell art forms, shell charcoal, activated carbon; tender coconut based products such as Snow Ball Tender Nut (SBTN), tender coconut squash, tender coconut jam; kernel based products such as coconut pickle, coconut chutney powder,

coconut chips, coconut *halwa*, defatted coconut powder, coconut oil cake and coconut water based products such as natural vinegar and sports drink. Production of these value added coconut products are done in decentralized units while marketing is done as a centralized activity. Each women unit maintains their accounts separately. The company looks after the centralized activities pertaining to the land, buildings, packaging, quality control etc. To ensure quality control of the products a well-equipped quality control laboratory has been set up with the assistance from Coconut Development Board. Apart from diversified coconut products few SHGs under SUBICSHA also take up production and sales of coconut seedlings. At present four such units are engaged in coconut seedling production and supply with an annual production of about 25000 seedlings. The total sales turnover of the SUBICHA company for the year 2009 was Rs. 3.2 crores. The members of the women groups under SUBICSHA are able to earn a minimum of Rs 125/-per day as wages besides the share of profit realized from time to time.

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Coconut Based Handicrafts

Production and marketing of coconut-based handicrafts is an avenue for income and employment. Many artisan families depend on this activity for their livelihood. A variety of handicraft items are prepared using shell, husk, midrib, stipules, spathe and wood of coconut. Traditionally coconut wood has been utilized for construction purposes. Now-a-days coconut wood is used for making wood panels and floor tiles also. Broom making using coconut leaf mid ribs is coming up as a cottage industry in many parts of the country, especially in some villages in Karnataka State. Coconut Development Board provides financial assistance to the coconut handicraft making units. There are about 18 such units functioning in different locations in the country managed by private and co operative organisations. One such unit viz., Kozhikode District Handicrafts Artisans Co-operative Society functioning at Koyilandy in Kozhikode District of Kerala State has got more than 200 artisans affiliated to it and has an annual sales turnover of about Rs. 8-12 lakh. It has acquired Geographical Indications registration for their unique coconut shell based product, hookah.

Community Managed Coconut Nurseries

Ensuring availability of quality planting material is a pre requisite for enhancing coconut productivity. In India the estimated annual requirement of coconut seedlings required for area expansion and for under planting/ replanting is around 24 million seedlings. The present annual production of seedlings is around 20 million seedlings only. There is scope for community managed decentralized coconut nurseries to provide a steady supply of quality planting materials of coconut, which would create employment opportunities in the rural coconut communities. In Kerala State, already there are few women SHGs involved in production and supply of coconut seedlings. Under the decentralized planning programme some of the *Panchayat Raj* Institutions (PRIs) also support such women groups. Decentralized approach for production and supply of quality coconut planting material has been successfully employed in the COGENT project on 'Developing sustainable coconut based income generating technologies in poor rural communities'. As part of the project 43 community coconut nurseries were established at various locations with the elite coconut genetic material identified and characterized through farmer participatory interventions (Batugal and Oliver, 2005).

Enhancing Income and Employment through Coconut Based Integrated Farming

Adoption of any cropping system by the farming community will ultimately be decided by its economic advantage. The interest for palm based farming systems has stemmed from both technical and economic grounds. When we consider the monocropping of the trees from the labour utilization point of view we find that barring the establishment stage, the labour absorption is low and seasonal, for the remaining life span. For the regions with surplus labour, this type of systems may not be desirable. Another economic disadvantage of monocropping is that the investment in establishing the crop till its bearing age becomes sizable, which a small holder may not be able to afford.

Coconut possesses the unique characteristic of allowing any crop combination in the inter-spaces. A well-spaced coconut garden provides adequate inter-spaces where it is possible to grow a variety of crops, both seasonal and perennial. When annuals or seasonal crops are grown in coconut holdings it is designated as inter-cropping; when perennials are grown it is called mixed cropping. A combination of inter-crops and mixed crops raised together are referred to as a multi-storeyed cropping system. Among the intercrops, elephant foot yam and ginger were the most profitable. Besides giving higher net returns per unit area, intercrops generate additional employment to the tune of about 130 mandays / hectare/year (Varghese *et al.* 1979). The vegetable crops compatible with coconut were snake gourd, amaranthus, coccinia, brinjal, and bitter gourd (Hegde *et al.* 1990). The introduction of the system resulted in generation of additional employment to the tune of 215 to 365 mandays / hectare/year. A mixed farming programme consisting of cultivation of fodder grasses and legumes in the interspaces of coconut, maintaining milch cows and recycling of cattle waste was studied at the institute at CPCRI, Kasaragod and Kayangulam (Sahasranaman, *et al.* 1983). An evaluation of the economics of the system taking into accounts all the inputs and income from coconut and milk showed that mixed farming could increase per hectare income considerably. Employment potential also increased several folds due to the introduction of this system in coconut gardens. Taking into account all the labour inputs for the project as compared to a pure culture of coconut, it was estimated that the annual employment potential increased from 150 man days/hectare to 1,000 man days by the introduction to mixed farming in coconut gardens.

In the case of coconut-based irrigated mixed farming system comprised of fodder grass, pepper, cross-bred cows and rabbits, it was observed that the net return from one hectare per annum could be 35 percent higher than coconut monocropping (Das 1991). While the annual employment generations in one hectare rainfed coconut monocrop and irrigated coconut monocrop are assessed at 120 and 144 mandays, the same was estimated at 620 mandays in the case of rainfed coconut + ginger system, 335 mandays on coconut + pepper + coconut + pineapple mixed cropping system and 850 mandays in coconut based mixed farming system.

The documentation of outputs of the project entitled “ Developing sustainable coconut based income generating technologies in poor rural communities” implemented in eight Asia–Pacific countries including India by International Coconut Genetic Resources Network (COGENT) under IPGRI (at present Bioersivity International) revealed that net incomes and employment from planting cash crops in small plots of land between coconuts have significantly increased. Not only income and total farm productivity enhanced, but also food security and nutrition since families planted, grew and ate their own produce. (Batugal and Oliver, 2005).

Conclusion

Although the growth rate of employment in agriculture is not so encouraging, it is important to innovate new opportunities in agrarian sectors where we could successfully employ the labour force. The world is shrinking to a global village and the international trade is still described in terms of global capital and peripheral labour. To reap the benefit out of the existing trade systems, we need to move up in the value chain of agrarian commodity chains. Here we have examined the scenario of employment absorption and potentials of Indian coconut sector and found the

employment scenario and potential at various segment of coconut commodity chain. In the present global competitiveness regime, future prospect of the Indian coconut industry lies solely on its overall competitive ability. India needs to exploit the fullest of her comparative advantage in cultivation, processing and marketing of coconuts. The Indian coconut sector has inherent strength of varied agro climatic conditions, huge domestic demand, highest productivity, and sound research and development systems. However, so far the sector has not effectively utilized the possible linkage between them for increasing the production and marketing efficiencies. Another remedy for achieving competitiveness lies in aggressive product diversification to reduce the dependence on copra and oil as the price determinants. Future research and development efforts should be initiated to understand and improve the existing status of the coconut based farming systems under different agro-climatic and socio-economic environments of all the coconut growing states. The employment potential generated by the intercropping programme is advantageous for in addition to the diversification of farm production; it opens up greater scope for better employment of the farmer and his family, and thus strengthens the concept of family farm. Since a vast majority of the small-holders pin their hope to homestead farming, research in this area needs much better attention than what is given to it now, at least from the socio-economic considerations.

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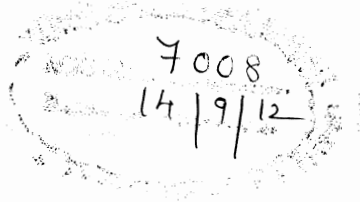
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