

# SOCIAL IMPLICATIONS OF RICE PRODUCTION

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**Abstract:** This paper draws attention mainly to the sociological aspects of rice farming involving technology use, varieties cultivated, labour use, occupational hazards and human resources in the rice services sector. The state invests heavily in the rice sector for economic reasons. However, at the on-farm level the profit margins have sharply declined. Farmers continue to grow rice in spite of diminishing returns because of the food security it offers. This contradiction in objectives will continue to keep the sector operating at a near subsistence level. Family labour continues to contribute significantly to the rice production. In the new irrigation settlement schemes hired labour will increase while collective action will be on the decline. The participation of women in rice cultivation will increase in the future. It would be required to assure equal wages for women and men. The participatory approach to irrigation management will have to be developed on a rational objective basis and not on altruistic notions. Rice production technology has not changed significantly over the years. Mechanization of operations has taken place at a slow pace due mainly to economic reasons. Growth of the urban sector will increase the demand for better quality rice. The growing fast-food sector will increase the demand for quality parboiled rice. Parboiling under inappropriate conditions is likely to cause serious health hazards due to the increased aflatoxin content in cheaper types of parboiled rice. Use of agrochemicals and transplanting are the main occupational hazards associated with rice cultivation. Vector-borne diseases like malaria are rampant in the new irrigation settlement schemes. This has an adverse effect on the labour productivity and drives farmers into the poverty trap. Human resources have increased in the rice service sector, but new methods of extension and efficient use of human resources have become extremely important.

## INTRODUCTION

Since time immemorial producing rice for consumption has been a way of life for most Sri Lankan villagers. The ancient irrigation systems and the unique social institutions that have evolved to manage them stand testimony to this fact. The large network of reservoir-based irrigation systems in the dry zone and the anicuts and tanks in the wet zone have been used for centuries for rice cultivation. These systems were managed

at the village level by 'vel vidane', village level leader responsible for water management. The ancient social institution of the 'vel vidane' continues even today in the more remote villages. 'Vel vidane' commands respect and has the ability to implement decisions taken at the 'kanna meetings' (pre-seasonal decision making meetings) on matters pertaining to water issues. However, the ancient social status and the authority of the 'vel vidane' are now greatly reduced.

In the past, most agricultural activities in the villages were carried out with considerable collective participation. In the 'attam' system available labour was shared to meet the labour requirement of each cultivator. When water or land was scarce, systems of land use rotations or sharing such as 'bethma', 'kattimaru' and 'thattumaru' systems were used. Furthermore, the ritualistic life surrounding cultivation of rice, had developed rice cultivation to a socio-cultural phenomenon which provided a basis for collective, emotive identity of the Sri Lankan communities. Preparing 'kiribath' (milk rice) and other rice-based sweet meats, is considered to be essential for important and auspicious occasions by the Sinhalese people. Major activities in rice cultivation such as land preparation, crop establishment and harvesting are preceded by certain rituals where the spiritual and belief systems were intertwined with the agricultural activities. The cultural facets of rice cultivation in Sri Lanka clearly indicate the close relationship between agriculture and the culture of the people.

Rice is a major component in the agricultural sector of Sri Lanka. Of the total extent of the annual field crops harvested paddy accounts for two-thirds. More than a half of the per capita calorie requirement of Sri Lankans is met from rice. The sector provides employment to a large number of people.

Paddy production has shown an upward trend in the past, recording a steady increase of over 6% per annum

during the period 1977 to 1987. During this period, the extent asweddumised increased by over 0.2 million hectares (Ministry of Finance and Planning, 1986). The continued investment by the state in major irrigation settlement projects shows the importance attached to development programmes having rice cultivation as the major economic activity.

The sociology of rice production includes a broad spectrum of issues and foci. It includes the antecedents of production activities as well as the implications of activities associated with rice production and belief systems. This paper will deal with (a) objectives of rice farming, (b) labour use, (c) technology use, (d) consumer preferences, (e) occupational hazards and (f) human resources in the rice service sector. Focusing only on these issues, does not imply that other issues are not important. But an attempt has been made to weave the other sociological aspects around these issues for purposes of keeping the presentation in focus and within a simple framework.

### OBJECTIVES OF RICE FARMING

Paddy is mainly a small holder crop. The average land holding size is 0.79 ha (Guntz, 1987). The production is carried out by those who either operate as a family enterprise using family labour or hired labour or various combinations of both. There are limited extents of commercialized large scale operations.

The state investment in the paddy sector is mostly for purposes of increasing the domestic food supply, reducing foreign exchange expenditure on food, improving the balance of trade position, and providing employment to a large number of people (Ministry of Finance and Planning, 1986). Heavy investments have been made to rehabilitate minor, medium and major irrigation schemes in order to increase the carrying capacity and to ensure longer periods of productivity. The Integrated Rural Development Projects (IRDP), Village Irrigation Rehabilitation Project (VIRP) and the National Irrigation Rehabilitation Project (NIRP) that plan to rehabilitate around 1500 schemes are indications of the importance placed on irrigated agriculture, predominantly for rice cultivation.

From a national point of view this investment is economically justified and shows acceptable levels of economic returns calculated considering the potential productivity of these schemes. However, the objectives of cultivating rice by small farmers may be quite different. It has been shown that the profit margins of rice production and real incomes of farmers cultivating rice have steadily declined over the recent past (P. Abeygunawardena and V. Kudaligama, 1990. Unpubl.; Weerahewa and Abeygunawardena, 1990). However, farmers continue to cultivate paddy in spite of the trend of diminishing profits for reasons of food security, and because the cost of rice cultivation is relatively low (Weerahewa

and Abeygunawardena, 1990). In a recent study of 18 tank-based irrigation schemes in both the wet and dry zones, it has been found that farmers grow paddy mostly for purposes of subsistence (NIRP, Unpubl.). In these schemes, given the option of water availability, farmers prefer to grow paddy even if economically more favourable crop options are available. Harvested rice is mainly used for home consumption. The stored grain is an insurance against food scarcities, and may also be used in major crisis situations when money is required urgently. Conversion of paddy to cash is easy anywhere in the country. Hence, farmers feel that stored paddy offers the ability to be ready for any unforeseen crisis situation.

Farmers adapt to the vagaries of the rural environment effectively. The environment in which they live is distant and distinct from that of the city which offers many services to the public. If the traditional survival strategies of the rural folk are to be changed, they must be accompanied by simultaneous changes in all spheres of the social and economic activities. The problems that rural people have in satisfying basic needs such as health, education, agriculture input supply and marketing are acute and may remain to be so, given the present situation. Given the relatively low infrastructural development, lack of support systems required to commercialize agriculture and the inability to cope with crisis situations, farmers in rural areas will continue to depend on time-tested and reliable traditional methods to take care

of the family food requirements, and prepare themselves for emergencies. Farmers can sell unhusked paddy quite easily to meet their cash requirements. Hence, the challenge is to find suitable alternatives to this traditional system in the formal sector of human services. Is the state bureaucracy which is both geographically and socially distant, able to provide a reliable alternative? Will the state be responsible and accountable for any unforeseen failure of such a strategy? There are numerous occasions when policy decisions have 'let down' farmers. Examples may be found in the spheres of pricing, trade and import/export policies. In state-centered, state-dominant and government-dependent rural economy such events cannot be ruled out in the future.

The changing objectives of farming may also have an effect on the proposed participatory approach to water management in irrigation schemes. The participatory approach to water management where farmer organizations play a key role in water management and carrying out any maintenance activities is being promoted in all irrigation schemes. Certain activities that were done by the state through the Irrigation Department and the Agrarian Services Department are being transferred to the farmer organizations. It is hoped that given the responsibility and managerial expertise, the farmer organizations will function more efficiently, and that the irrigation schemes will cease to be a major financial burden on the state. The problems of water management and conflicts

between the head-enders and the tail-enders in irrigation schemes are well known.

The traditional 'bethma' system of water management during times of water scarcity has been tried out in modern irrigation schemes but with little or no success. This is because it is an attempt to transplant a 'social technology' into a social system that is incompatible with the technology. The social environment that gave rise to the 'bethma' system of water management has changed radically, and the system is hopelessly inappropriate in the socio-economic environment of present day rice farming. The basis of collective-action and sharing resources was the result of collective ownership of property, strong bonds of mutual dependency and kinship networks. The situation has changed with the advent of state-sponsored development schemes and economic policies. In such situations farmer organizations may prove to be ineffective if set up on altruistic and community notions. It is not known if organizations will be accepted as legitimate bodies by all farmers and that they will abide by the decisions taken. For example, the past performance of Cultivation Committees though appeared to be logical and successful on paper proved to be most ineffective. Political manipulations and interference into the village level organizations which has become a way of life in Sri Lanka, is difficult to eradicate through legislative or administrative regulations. This is a major challenge that the policy faces. If farmer

organizations fail to be effective, that may lead to further chaos and conflict resulting ultimately in a reduction in production, increasing economic disparity, and pushing the farmers into poverty. Here, we face the difficult task of having to develop social technologies that will be compatible and appropriate to the prevailing socio-economic situation, the value system and the overall government policies. This could be achieved by developing rational management systems for farmer organizations that are not hindered by the state bureaucracy and political machinery.

### LABOUR USE

Agriculture as a whole is looked upon as a major area in which employment generation can be effectively done to absorb the large numbers that enter the job market each year. At the conference on 'The alleviation of poverty in Sri Lanka', organized by the Central Bank and UNICEF held in 1987 many references were made to the agriculture sector as being capable of providing employment and income generating avenues. The government economic development policy statements issued also make reference to the potential the sector possesses. The more recent thrust in this regard is being made by the 'Janasaviya' programme in which agriculture is seen as a major avenue to alleviate poverty. The report by the High Level Committee of Officials on Poverty Alleviation through People Based Development of May 1988 also

has considered agriculture as a major sector for employment generation and increasing incomes.

Preferences and aspirations have to be considered in respect of people entering the job market. In order to ensure commitment and continuity one should be able to do what one likes to do. If not, it will cause people to change jobs at the very first opportunity to get a more attractive occupation. A recent study undertaken shows that most school going youth do not aspire to become farmers. They prefer occupations considered more 'prestigious' such as medicine, engineering and teaching. Even when informed of the different occupations that are possible within the sector, very few chose agriculture as a full time occupation. Many show great interest in having an agricultural enterprise as a hobby or as an alternative and as a supplementary source of income (M.W.A.P. Jayatilaka, 1990. Unpubl.). In a study done of several village irrigation schemes, it was found that the youth did not like to get into any form of agricultural occupation. They preferred to be in the public sector, where there was a regular source of income and greater prestige. Although this evidence is scant, it still gives an idea of the attitudes of youth towards agriculture.

It can be assumed that youth of today are not attracted to agriculture as the main occupation. This situation will lead to a greater demand for occupations in the industrial and service sectors. Migration to urban areas is likely to increase.

It would, however, be short-sighted to suggest that we attempt to mechanize rice farming and reduce the drudgery of work, and thereby make the occupation more glamorous and 'high tech' in appearance. Diminishing profit margins in rice cultivation and the high cost of machines will not enable us to take such a course of action. The challenge here is to have a realistic assessment of the potentials of the agricultural sector to generate employment, and based on this information, to make agriculture more attractive to youth. There is a need to provide better publicity of the potential the agricultural sector holds and provide easy avenues through which the necessary requirements for starting or improving agricultural enterprises can be obtained. Here, the economically and socially viable enterprises should be identified and tested before making recommendations.

Within the enterprises that are at present managed by farm families, family labour continues to contribute a significant proportion of time to rice production (P. Abeygunawardena and V. Kudaligama, 1990. Unpubl.); Weerahewa and Abeygunawardena, 1990; Abeysekera, 1990). In the new irrigation settlement schemes, hired labour use has increased to meet the high labour requirements of the more systematic and programmed activities of the agricultural plans implemented each season. Most new settlement schemes have people coming from different parts of the country. Attempts are made to settle

people of similar geographic origin in the same locality. However, the traditional shared labour 'attam' system is not possible in a commercial atmosphere where reciprocal obligatory relationships are replaced by relationships involving the exchange of money. Therefore, hired labour use is on the increase. However, in an attempt to minimize the cost of production, especially in the light of increasing prices of inputs such as fertilizer and agrochemicals, the use of family labour (both women and children) is likely to increase. As a result the traditional gender division of labour will erode. Women's involvement in all types of agricultural operations will increase. Thus, if equal wages for equal work is not accepted as a norm, women will continue to be underpaid and even suffer from reduction of wages due to their low bargaining position and ability. They will be called upon to work more for less money.

## TECHNOLOGY USE

The technology requirements of rice cultivation are many, ranging from those associated with land preparation, irrigation, choice of planting material, planting, post-establishment management, harvesting, postharvest operations and processing. In Sri Lanka, modern technology use is mostly associated with mechanization of land preparation, use of improved varieties, application of fertilizers and application of agrochemicals for management of insects, diseases and weeds. This section

examines the identification of appropriate technology and the socio-economic conditions necessary for adoption.

The appropriateness of technology suitable to given social, economic and environmental conditions requires continuous adaptive research. This was the basis for launching the adaptive research programme by the Department of Agriculture with foreign assistance. However, for the effective functioning of this system the generation of technology and the introduction of new technologies in agriculture should take place at a rapid pace.

The increase in demand for technology other than for new varieties, fertilizer and agrochemicals has been marginal. The sector has not reached a level of production and economic activity which can be described as dynamic to create such a demand. This is quite understandable given the low profit margins of paddy cultivation. Within the existing framework, it will be only those who have been able to develop to what is referred to as the 'petty' farmer class, who have a multitude of enterprises, and have a diversified economic activity base, that can effectively make use of the technology developed. However, the majority of rice farmers do not fall into this category; they remain the subsistence farmers who will attempt to reduce costs by increasing the use of family labour.

Transplanting is a major technology that is promoted to increase the paddy yield through better management of the crop. When one examines the extent

under transplanted paddy it is seen that this has not increased dramatically. The extent of paddy land transplanted stands at around 25% of the total area grown to rice. The extent transplanted has now reached a plateau after an initial expansion during the green revolution.

Of the numerous technological options available to the farmer he often selects new improved varieties and fertilizers as these provide directly observable results. Other technologies used include weed control, irrigation, and the application of pesticides. Returns to expenditure could be a criterion that farmers may be able to use under resource-scarce situations where there is competition for the use of different technological options.

Many improved rice varieties are cultivated in Sri Lanka. Of the total land under paddy, nearly 85% is under new improved varieties of rice. We have reached a near saturation point in the expansion of the extent under new improved rice varieties. Therefore, we may have to consider using other methods of increasing yields such as breeding varieties to suit specific regional agroclimatic conditions.

The technology adoption and diffusion rates remain low. For instance, the application of straw, a low cost but labour intensive method, has shown to improve the soil and help in increasing yields. However, farmers still dispose straw by burning. Low rates of adoption of some technologies are related to the cost while others are attributed to lack of knowledge. The need to increase the

technical ceiling of rice yields using a different combination of technologies is felt at present. Identifying these packages to suit the regional variations is a challenge we face today. In this search a fresh look at the available technology and its application are necessary. Known cost-minimizing techniques of rice cultivation developed in the past are hardly adopted by the farmers. It is necessary to identify suitable packages and make them available to farmers.

The technology used in rice production has not had major changes. Mechanization of crop establishment, cultural practices and harvesting have increased only slowly. The worsening economic situation may favour the affluent farmers to mechanize operations. Supplementing the farm income through other sources may be one strategy to improve rice farming. The integrated nature of the rural farm with a resource flow among the different enterprises should be exploited to complement each of the components and improve the whole farm. However, the administrative compartmentalization of agriculture and animal husbandry into a multitude of specialized public sector agencies is a serious bottleneck. We have been unable approach the farm as a closely integrated unit of crop-livestock-farm family.

### CONSUMER PREFERENCES

The rice production and consumption across the country show a clear regional variation. Consumption

habits in the southern region are different to that of the rest of the country. In the southern region the preference is for raw rice with the bran, while the rest of the country shows a clear preference for parboiled rice. Almost all eating houses and restaurants generally use parboiled rice. No significant changes are envisaged in the above consumption patterns.

The expansion of the urban population and the spread of urban habits to the rest of the country may suggest changes in the consumption and varietal preferences. The rapid expansion of 'fast food' outlets in the cities and the suburbs, selling packeted rice meals, suggests that the demand for 'samba' type small-grained rice will increase. However, trend studies and appropriate methods of estimating the demand must be undertaken when addressing this issue.

Rapid urbanization may increase the demand for better quality processed rice, and also the demand for quality products made of rice flour. Quick and easy methods to cook rice and prepare items of food made from rice may increase in demand. The growing affluent class may consume more exotic types of rice varieties. The demand at present is not met by local production but through imports. This may be an area for expansion in the future.

Parboiling is done mainly to reduce the wastage during the milling process. It is done on a small scale for home consumption and on a medium to large scale by rice mill operators. In most commercial parboiling and milling

establishments, the operators try to minimize labour costs. One practice that has a negative effect on the quality of rice is the soaking of paddy for a few days in water tanks. Often, anaerobic fermentation occurs. These conditions favour the growth of certain microorganisms, which produce toxic substances. The subsequent heat treatment and uneven drying also contribute to contamination. Extensive studies carried out recently have shown that a high proportion of parboiled rice in the market, particularly the low-priced ones has a very high aflatoxin content, well above minimum standards (J.M.R.S. Bandara, 1990. Unpubl.). Inappropriate soaking conditions with long durations of fermentation periods have shown to increase the aflatoxin content to dangerous levels. Although the cause has not been established, a close relationship has been observed between parboiled rice consumption habits and incidence of liver disorders. Proper educational monitoring and quality control are necessary to avoid long-term health problems that may develop among the consumers of cheap types of parboiled rice.

### OCCUPATIONAL HAZARDS

Application of chemicals, transplanting, and to a lesser extent, use of farm machinery are the main operations which involve occupational hazards in rice cultivation. Direct health hazards of insecticides and herbicides are due to contamination and ingestion.

In a comprehensive study done using only government hospital records, it has been shown that during the period 1975 to 1980, an annual average of 13,000 people were admitted to hospitals for acute pesticide poisoning, of whom 1000 died. Of these cases, 73.1% were attempted suicide cases while 17.1% were common forms of poisoning. These figures are an underestimation of the real figures of pesticide poisoning due to under-reporting, consideration of health records maintained only in government hospitals and because cases of mild poisoning are seldom reported. Cases of pesticide contamination of food are also common (Sim, 1989).

With the prevailing high prices of agrochemicals the rate of adoption of pesticides may decrease, but commercial operators may resort to indiscriminate application of pesticides, a situation that may pose serious health hazards to the consumer. At present there are no monitoring systems to measure levels of toxic contaminants in food. An agricultural or a human service sector organization may have to develop this function. Transplanting is also associated with serious health hazards. In a recent study (M.W.A.P. Jayatilaka, 1990. Unpubl.) it was found that women when they transplant paddy have to stand in the mud continuously for long hours over a span of a few weeks. Many complained of lesions developing in their feet and growing to become wounds. The respondents attributed the wounds in their feet to fertilizers and other toxic agrochemicals. However, the clinical

aspects and validity of this observation remain to be examined. Lesions also develop in the fingers of women transplanting rice due to the abrasive action of mud. These soon begin to bleed. By about the eighth to tenth day of working in the paddy fields the bloody lesions reduce the transplanting capacity. Few stop work completely while the majority carries on regardless of the lesions to earn the daily wage.

The expansion of irrigated settlement schemes and migration of people in the recent past have resulted in the spread of vector-borne diseases such as malaria and encephalitis. Malaria in particular, is rampant in the dry zone. This is a very debilitating disease, and if the bread winner is infected the cultivation process may be seriously affected. Few farmers lease their plots of land for a season to tide over the difficult time and cultivate their plots once they regain their health.

Research done by the Parasitology Department of the Medical Faculty, University of Peradeniya, has highlighted this problem. Field investigations and consultations with block managers in the Mahaweli Scheme have confirmed that malaria may cause farmers to fall into the poverty trap. The present farmer insurance scheme does not consider insurance coverage for diseases like malaria. Therefore, in the absence of a health insurance scheme that takes into consideration these location-specific health problems faced by the rice cultivator in settlement schemes, the potential of more farmers falling into

the poverty trap remains high. The expansion of settlement schemes and the relatively low emphasis paid to health pose a grave challenge requiring closer collaboration between human services and production services in agriculture.

### HUMAN RESOURCES IN THE RICE SERVICE SECTOR

Research and extension are two major components required to develop the rice sector. The research personnel have a responsibility to develop appropriate technology for the sector and extension to effectively deliver same to rice farmers. The staff of the Research Division of Department of Agriculture has grown from a total of 414 in 1981 to 511 in 1988. The expansion occurred mostly at the research assistant level. The other grades of the research hierarchy have remained virtually constant. Experienced and qualified scientists are relatively few in number. The proportion of Ph.D. to M.Sc. qualified scientists to B.Sc. graduates is 1:4.1:5.0, an extremely bottom heavy structure (CARP, 1990).

The rate of brain drain although not having a major effect on the system in the last decade has had its toll when a longer period is considered (Karunathilake, 1978). It has been shown that there is a steady stream of professionals including agricultural scientists leaving the country. The degree of alienation and demoralizing that has taken place has resulted in low motivation of research officers. This aspect needs to be

investigated. However, one can safely assume that due to many work-related, and social and economic reasons their motivation is quite low. Increase in numbers of research officers may not by itself lead to an increase in research output. Team work, proper guidance of young scientists by senior scientists, incentives at work, reduction in the top-down approach to administration, and cultivation of professional standards of the institutions may be helpful.

The Extension Division of the Department of Agriculture had a total of 3124 technical staff officers in 1989/90, of whom 0.8% were Assistant Directors of Agriculture, 0.7% Agricultural Officers (Head Office), 2% Segment Agricultural Officers, 2% Headquarters Subject Matter Officers, 6% Segment Subject Matter Officers, 17% Agricultural Instructors, 16% Office Krushi Vyapthi Niladharis and 55% Range Krushi Vyapthi Niladharis. Here too, the lack of resources to carry out extension functions efficiently and the socio-political environment has demoralized many people.

The recent conversion of the range Krushi Vyapthi Niladharis to Grama Sevākas has created a serious vacuum in Extension Division of the Department of Agriculture. Farmers are now at a loss when it comes to finding out a suitable person to obtain agricultural information. With the provincial councils taking over agricultural administration and non-availability of funds to carry out development and extension activities, extension programmes may be hindered severely. Working through farmer

organizations in implementing agricultural extension is an alternative strategy that is being debated. The experience of the catalyst programme (ARTI, 1985) implemented to develop farmer groups in the Gal Oya Scheme with the assistance of the Agrarian Research and Training Institute, which was found to be a major success may provide some information and experience required to use this strategy.

### CONCLUSIONS

We have tried to examine what may be the future scenario with regard to certain sociological aspects of rice production. The issues discussed have helped to identify several challenges of rice farming in the next decade. Some aspects are well understood, but others continue to be obscure even after close examination. Some aspects have serious policy implications. Some of these policies need to be re-examined if one is to work towards a national average yield of 5 t/ha of paddy. It is a grave mistake and risk not to recognize the role and position of the rice production system in the country. The emphasis paid to export promotion in food crop sector, and plantation crops tends to mask the importance of rice to the local economy. Will Sri Lanka be able to develop a strong industrial sector to afford this change? What alternatives do we have to offer to the large number of rural folk engaged in farming? Can the new export crops provide the answer to the problems that the sector is facing today? Will all types of ricelands be capable of easy

conversion to grow other field crops and even if this is so, can export crops be grown in all ricelands? These are some questions that will come up in the next decade. In this regard the following points need to be highlighted:

- The importance of subsistence rice production which ensures food security for the majority of people in Sri Lanka needs to be adequately recognized. The sector should continue to receive state assistance that it has enjoyed in the past.
- The contribution made by family labour to rice cultivation will continue. However, collective exchanges of labour will decrease and be replaced by wage labour. The family labour will be called upon to play a more dominant role in making the family farm work. The young and educated will be increasingly reluctant to become farmers. Part-time farming however, will increase as more people will seek additional sources of income.
- Technology for the rice sector is at present developing at a steady but slow pace. A dynamic economy within the rice sector as well as related industries is essential to take paddy production over the threshold levels it seems to have reached.
- The expansion of the urban sector will require new adjustments in the rice industry where more quality products will be in greater demand. The majority of Sri Lankans will require inexpensive types of rice.

- The occupational hazards of the rice sector faced by farmers as well as the female workers need a closer examination and a search for effective remedial measures.
- The human resources in the rice service sector both in research and extension need to be revitalized and developed to a motivated group. The recent changes in administration must stabilize soon to make the system adapt and function smoothly.

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