Value Addition to Agricultural Resources – The IPR Angle

P Ramesh Kumar and V Prakash†
Central Food Technological Research Institute, Mysore 70 020

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The present status of food processing industry in India is delineated to pinpoint the importance of mitigation of food losses, extent of value addition, byproduct utilization and trade of processed food products. The opportunities in food processing in India have been identified and power of India in traditional foods has been specified with a view to capturing national and global markets. For successful exploitation of the opportunities in food processing industries, it is essential to act in terms of intellectual property protection and a huge awareness that need to be brought about amongst the academia, industry and research organizations. This will have an exponential growth in the human resource development, establishment of food processing parks/corridors, development of entrepreneurship, strengthening of internal chain, quality of the processed products, timely delivery of the products, sustainable technology and convergence of technologies as well as emergence of products/processes by interfacing and networking globally and perhaps niche itself for Indians potential in the world market.

Keywords: IPR, agri-resources, value addition, innovation, food processing, food safety, traditional foods, intellectual property

Food processing is a sunrise industry in India and comprises both informal and organized sectors. The informal sector includes more than 1,40,000 bakeries, about 5,000 pasta goods units, 1,30,000 traditional food processing/production units, 2,000 poha making units and 600 spice processing units. The organized food processing sector consists of about 800 large flour mills, 450 modern rice mills 5,000 fruit and vegetable processing units, 800 solvent extraction (oil) units, 100 milk products units, 100 meat processing units and 130 fish processing units1,2.

In fact, small-scale industry is the power of India. There are, presently, 3 million small units (organized), which employ 30 million people. In fact, about 95% of the industrial units are small-scale units and these cater to 80% of all industrial employment. Also, 40% of industrial output comes from small-scale units and these contribute to 34% of the country’s export. These units also contribute 6.29% to GDP. Their average growth rate is 7.4%, as compared to 4.7% of the industry in general.

Importance of Food Processing

Food processing industry is of enormous significance for India’s development because of the vital linkages and synergy that it promotes between the two pillars of the economy, namely, industry and agriculture. India is world’s second largest producer of food and has the potential to become number one in due course of time with sustained efforts. The growth potential of this sector is enormous and it is expected that the food production will double in the next 10 years and the consumption of value-added food products will grow at a faster pace. This growth of the food processing industry will bring immense benefits to the economy, inducing agricultural outputs, meeting challenges of productivity per acre, generating employment and raising the standard of very large number of people cut across the country, specially, in the rural and semi-urban areas3.

There are several inherent strengths of the informal food processing industries in India. The major strengths include employment generation, industrial growth in clusters, regional development, local sustainability, entrepreneurship, sustainable consumption, low cost of production and flexible manufacturing system. There also are several disadvantages, such as, low hygiene, automation problem, brand equity, long-term sustainability, profit growth rate, lesser modernisation and absence of hardly any innovation.

Long Term Strategic Research

Almost all food processing industries in informal sector do not have any R&D wing, though few organized sectors have invested in establishing R&D units for improving the existing technology or product
quality. Some even explore related areas to obtain leads for expansion of the unit and diversification of the product line. In fact, long-term strategic research is a treasure in the pipeline for the food-processing unit. The industry can have its own R&D centre or can contract R&D to established institutions.

One should know the critical factors, which affect the research and industry environment for the R&D organization in the country. The institute should keep a watchful eye on the global economy in food industry and reengineer the organization dynamically based on function. It should improve the cycle time, i.e., a concept from ‘laboratory to grower and processor’. A close watch is also required on emergence of new technologies and making amends to change accordingly. Training and retraining of personnel under the human resource development activity should be always given a priority, in addition to adopting e-governance and e-college avenues. Such R&D institutions are the best bait for contracting R&D as well as long-term strategic research by the food processing industry.

The Power of India in Traditional Foods

The traditional foods are a rich heritage of the country and offer wide diversity because of their origin in different regions and their multidimensional culture. They have evolved through trial and error over many centuries of cultural, social, economic and sensory experiences. There are more than 5,000 traditional foods in India.

It is unfortunate, that scientists and technologists as well as the business community have not devoted adequate conscious efforts to the development of these foods (a) for upgrading their technologies, (b) to the improvement of raw material, shelf-life, protection and quality upgradation and (c) to the aggressive marketing and distribution of traditional foods to meet the growing and fast changing consumer needs that are taking place due to urbanization and impact of other global influences.

The real benefits of this great food tradition and its future potential can help to create the largest employment opportunity per unit of investment, raising of human productivity through improved nutrition and liberation of the women folk from drudgery so that their capabilities could be utilized in a more productive manner.

Very little is known about the many dimensions of the traditional food products that have evolved over generations, for example, how they came to combine the ingredients judiciously so that they mutually supplement each other nutritionally to improve diets, time and temperature of cooking, period of each stage of preparation, flavour development, storage and purposes of consumption. There is still need to understand our social substrate on which this knowledge grew and to direct it more purposefully in meeting future needs. In spite of our scientific and technological institutions giving inadequate attention to their development, these foods have made some significant progress due to imagination of the people themselves in their homes and for the creation of innumerable small-scale entrepreneurs to make them commercially viable.

Challenge of feeding the rising numbers of human beings has since more than doubled and is likely to double again over the next two decades. Urbanization is taking place at an unprecedented place. It is expected that by 2010 AD, nearly half the world population will be living in urban areas and this will itself break the ethnic and cultural barriers, which will create a new multicultural food pattern. Foreseeing the future needs of food, the form in which it will have to be produced and the nature of changing food needs, it is imperative to have a fresh look at the traditional foods, their technologies to meet the present needs and the rising future multicultural requirements.

When we ask ourselves the question as to whether we have capitalized our traditional foods fully, the obvious answer is ‘No’. We have not even studied the health aspects of our traditional foods nor extended the HACCP (Hazard Analysis and Critical Control Points) and GMP (Food Manufacturing Practices) in their manufacture. Same is the case for packaging, extending shelf-life, defining quality of raw materials, marketing and improving to meet consumer preferences. Hardly any effort has been put up on indigenous fabrication of adaptable and energy saving processing equipments. No alternatives have been found to lessen sugar and fat content of these foods and still retaining grandmother’s taste. The industry is still uninformed about changing food laws and this is a real constraint.

Because of the lack of record of the knowledge base, the traditional foods of India are slowly getting extinct at a faster rate. Our younger generation hardly knows about the heritage of our traditional foods. A large chunk of knowledge has already been lost and if we don’t take urgent remedial steps, the heritage will
be lost completely. Some of our heritage in traditional foods is blatantly exploited and patented by other countries. Instead of using our traditional foods as nutraceuticals both in prevention and control of various diseases, we are opting blindly and getting accustomed to western junk foods. Considerations from nutritional and toxicity implications of foods are rarely given an importance in recent years. In these contexts, it is heartening that CFTRI has initiated intensive efforts on digitization of Indian traditional foods.

**Intellectual Property Right (IPR) Protection**

History of patents is not new to the human race. There are trade secrets, trademarks, instances in society with many skills, many processes are moving from generation to generation through families, sometimes through tribal knowledge and sometimes through groups of people and therefore a time arrived when as the industrial revolution was taking place, that these innovations had to be recognized by society. There arose the need for patent and the need for protection.

In the context of globalization and liberalization, as well as signing of WTO agreements, it has become vitally important to India to protect the IPR. In this respect, the country has received excellent dividends due to the winning of basmati rice patent granted to a US firm, right from the pioneering win and challenge of turmeric patent from CSIR all the way to the documentary proofs in the case of basmati patent by CFTRI, Mysore, to refute the novelties claimed by the US firm which was challenged for establishing characteristics of Indian Basmati rice.

**Role of Societal Knowledge**

This is a very important factor in terms of IPR. Why do we say societal knowledge? We say so because in society there is a cumulative knowledge of individuals over several generations, which can be leveraged for the benefit of the society by a group of individuals or by groups of people. Many times it may be used for better performance, better facilities and is often misinterpreted, as commercialization of knowledge and it is also very important for us to realize that no knowledge can be stolen. In fact it is the information that gets stolen whereas knowledge remains permanent in a society. But knowledge is also dynamic and is permanently dynamic.

**Recognition of Knowledgebase and benefit to Society from IPR**

Anything that is commercialized out of this innovation, some part of that benefit must go to the individual and perhaps the team and in a larger extent to the Society. This is where many times there is controversy. Perhaps even in the patent law, it is very vital; part of this income must go to the development of society and to the development of needy persons is not very clear. It may be in the case of tribal knowledge to reach them for better health and facilities or this may be to improve the nutritional status of children etc. Whatever may be the societal aspect, a part of the credit must be returned back to the society which has helped to take the patent and that makes a lot of difference in tomorrow’s networking of knowledge and the patent culture and well being. Does the law provide for this?

**Ethics and Ethical Nature of Patents**

This is a very primary and fundamental factor of authorship and it is the realm of a patent attorney and this patenting system must address it especially in agribusiness and food processing. Most of the times when innovations are made, they are patented and assigned to the institution or industry or organization, whether it is a process patent or product patent. The concept of bubble patent is equally important. One needs to protect the patent in terms of putting an important patent inside a system and make several patents around it in such a fashion that even for a global or large company it is difficult to penetrate within the life time of a patent normally which is 7-14 years unless the legal framework allows the knowledge base of networking all the patents around it.

**Utility and Uniqueness of a Patent**

Lastly, when it comes to the prior-art, the utility and uniqueness of a patent, one has to look at the life of a patent and address the issue and in that case the role of science becomes very important and the art of reading, writing, understanding and also interpretation of patent is a school by itself. We have to also keep a track when a patent dies. There are a large number of people who say one should not at all file a patent. There are more minus points of this argument than plus arguments but one thing is for sure, having patented a process or product, the person concerned or the group or group of persons concerned have always the liberty to charge it or not charge and it is left to them. Therefore, in order to protect the Nation’s intellectual property, we must file patents and fight at the
Networking Nations through IPR

India won basmati patent (especially claims 15, 16, 17 and also 4) through the efforts of hundreds of people working towards fighting this patent. It is here that India should really look at into newer alliances and newer partnership in shaping newer regulations with harmonization. It must be intra country and inter country. What one can call unrelated partnerships! It is also important to focus on training and retraining. Many get struck with the college knowledge and training which many times are good only for about 5 years. If one does not train oneself, one will be left behind. Hence emphasis is required in various sectors for training and retraining. One has to give special attention to this if we want tomorrow’s India which is quite different from what we are today in the IPR arena.

Patents and Genetically Modified Foods

In recent years, the food industry has seen greater use of technology to create novel foods and food production processes. There have been particular developments (sometimes well publicized) in the use of genetically modified organisms (GMOs) and microbial technology in food production. For example, food ingredients, such as amino acids and vitamins, and enzymes for food processing have been produced by fermentation techniques using GMOs. Transgenic plants have been created to produce crops with increased disease and pest resistance, greater yield capacity, better drought tolerance and new ripening characteristics. In meat research, work is taking place to produce farm animals with, for example, faster growth rates and increased resistance to disease. Most of these developments are patentable provided certain requirements of patent law are met⁹.

Many genetically engineered crops have been field tested successfully. The traits inserted into these crops include genes designed to protect against pests or stress (such as freezing or saline soils) and genes designed to alter the character of quality of foods. The
first genetically modified whole food to be available to consumers is the Flavr Savr Tomato, which was engineered for improved ripening characteristics (to reduce waste). Plant varieties and biological processes for the production of plant varieties are excluded from patent protection by Article 53b EPC and Article 4 of Directive 98/44. The rationale behind the exclusion is that in most countries an alternative system of plant variety rights is available. A patent application in respect of a genetically engineered plant will be allowable so long as the engineered plant is not held to be a plant variety and the invention meets all the other requirements for patentability. Animal varieties and essentially biological processes for the production of animals are not patentable under Article 53b EPC and Article 4 of Directive 98/44.

Some novel foods may consist, wholly or in part of microorganisms. How do the principles of patent law apply? Can natural, newly discovered microbes be patented? Mere discoveries are not patentable. However, if a microbe must first be isolated from its environment in order to use it, then the process for isolating it may be patentable. If the microbe produces a novel substance that can be properly characterized by structure, the isolation process or other features and is new in that it was not previously recognized then it might be patentable. The discovery of the production of a new substance by a microorganism may be patentable. It is difficult to patent a naturally occurring microbe per se, because of the argument that it is not novel, unless an additional feature applies (for example, a process of isolation). Microbial cultures of naturally occurring organisms are, for this reason, often patented as biologically pure cultures. If a microbe is genetically modified in the laboratory or is an isolated mutant then it will be easier to demonstrate novelty and obtain patent protection. It is clear that the EPC does not prevent patents on microbes so long as the other conditions for patentability are met. In the USA, until 1980, the Patent Office refused claims to living things on the grounds that they were not patentable subject matter. However, in the US Supreme Court case of *Diamond v Chakrabarty*, the court said that ‘anything under the sun that is made by man’ should be patentable (provided the other requirements of patent law are met). The GM food patent World is not too far from us but the challenge remains of safety and public domain information.

**Biopatents, Gender and Food Security**

The impact of IPRs on who is developing what, who will control innovations and in whose interests is vitally important for future food security. This requires a clear understanding of the differing roles and options available to people in different farming situations, in particular, women. Women play a decisive role in household and national food security, they often supply subsistence food for local markets as well as for their households. They work more than men and play multiple roles from agricultural production to post-harvest processing and marketing as well as in nutrition and food safety. Bio patenting and PBRs carry with them the aims and assumptions of the system of industrial agriculture of which they are a part. They can threaten agricultural biodiversity if they result in the widespread use of uniform varieties. They can encourage the rapid spread of industrialized farming systems to the developing world, and the speedy promotion of genetically modified crops and animals, which are highly controversial. Recent findings indicate that the promotion of these technologies will not advance the food security of the poor.

**The WTO Issues**

There are several challenges, opportunities and strategies in the WTO sector. Just to mention a few, domestic and export subsidies continue in developed countries even today. One may not be able to avoid it. Only 20% of domestic support and 36% export subsidies will be removed by the west but on the other hand we are talking about to reduce it much more. Is it fair? Have we asked sharper reduction in these subsidies in the millennium round of WTO negotiations? The agreement on Application of Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) have no time bound and specific commitments. We should ask that specific commitments in the final millennium round through TRIPS Agreement projects and intellectual property. Geographical appellation in which all patenting and trademarks, which are essential, to core property. Geographical appellation in which all patenting and trademarks, which are essential, to core property. Geographical appellation in which all patenting and trademarks, which are essential, to core property.
asking us to keep quite, but we are keeping quite for ourselves. Tomorrow’s international traditional food business may be selling each other’s traditional food with brand equity and one might have to buy from abroad and we have to be cautious about it. Therefore, through these systems of operation, we need to address in the WTO millennium round in terms of clarification and tariff reduction in separate systems both internationally and nationally in many areas and at the same time to look into encouragement and scope for negotiations to be built in as we reach the finer moments of negotiations. It is here may be the national laboratories and academia and the industries should shake hands and say that we shall work for the country as one in the team spirit irrespective of who gets benefit. Ultimately the benefit is to the customer and the consumer and we have to remember the final benefits should reach the farmer, agri business entrepreneur and innovator concerned. India has got the power and before anybody worries about us, let us worry about ourselves and take this country into higher levels of productivity and production thus generating more jobs and helping poor infact to increase his buying capacity with a holistic approach for overall economic development. It is only then the development of rural India can happen and we have a different model, which can be termed as ‘Model India’.

Regulatory Issues

The food safety priorities for South Asia is quite different when we look at the number of different foods both ethnic and the traditional foods and the multiplicity of the raw material all locks into a major system of addressing the local regulatory systems vis-à-vis Codex Alimentarius. In order to reach the pinnacle of the harmonization one has to really look at the chain of operations from the raw material all the way down to the final product through a safety chain involving good agricultural practices, good harvesting practices, good storage and transportation practices and good manufacturing practices towards that safety and health aspects of food. It is from this angle with the signing of multi-lateral trade agreement; the food trade certainly has reached very high levels of international importance. This is also being reflected by the GATT and the WTO agreements, which makes mandatory for the member countries to have international standards in this food trade. Application of sanitary and phyto-sanitary measures would also become mandatory into the food laws as it moves towards the harmonization protocols. Even though, the Codex Alimentarius Commission is the basic guideline to a large extent, which is valid for a number of countries, each country may have its own standardization and methodology for analysis and hence the Codex system needs to give special consideration to this aspect. This is especially to as we dynamically amend the methodologies for additives and safety limits based on the nutritional and economic status of the population and their reaction or no reaction to certain foods. In this aspect, for the ultimate benefit of the consumer, it is very vital that National Codex Contact points need to be more pro-active in almost every developing country and ensure that the agenda is carried to the codex meeting to give more inputs, addressing issues of immediate relevance and not just only look at the following codex decision. IPR is very crucial in this arena. It is here that the pro-activeness of the institutions, academics, industry and the consumer will play a major role in the food safety and the role of regulatory system in each country as long as we relate it to IPR. Ultimately, the consumer should get a safe food and that the manufacturer and the regulatory systems should ensure this to all strata of consumers and ultimately the benefit is to the customer and the consumer and we have to remember the final benefits should reach the farmer, agri business entrepreneur and innovator concerned. India has got the power and before anybody worries about us, let us worry about ourselves and take this country into higher levels of productivity and production thus generating more jobs and helping the poor, infact to increase his buying capacity with a holistic approach for overall economic development. Let us also not forget that we have a strong culture and we have a very strong history and we cannot ignore all of them and just look at the future with a few gadgets to take us into a new world. It is always the people who make the difference and these people have always made the difference for the country as one with rich intellectual history. Let us merge the power of the people, power of the knowledge and then only the future can be wonderful with a sustainable system operating for economic advantage.

The Way Forward

If yester-years and tomorrows belong to information technology (IT) and todays and the day-after belong to biotechnology (BT), food technology
and food processing would dominate the market in future, since it has the advantage of using the sharp cutting edges of both IT and BT. When we look at food safety and food security as linked to agricultural production vs productivity and the demand of the knowledge-based consumer for safe food, there is a great challenge for the research and development organisations, institutions and industries to have a paradigm shift from development to innovation. This challenge can only be met by high intensity incremental value addition to technologies by addressing from a multidisciplinary networking angle, both globally and regionally. The role played by traditional and ethnic foods and the awareness of nutrition and food safety has challenged the market and in turn the scientist is pushed to ensure the development of such a product with high science and high technology, without sacrificing the accepted sensory profiles of similar foods over generations. Thus the global market for processed food, if we look at the 2020 vision, is obviously unlimited with the processed foods on the one side reaching the rural masses in developing countries and on the other side into the cyber space and the ‘mini super markets in the refrigerators’ in the developed countries. The developing countries will have a major role to play in sustainable agriculture, productivity, primary and secondary food processing for value addition and the issue of IPR will have a critical contribution in this crucial areas for the country.

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