CHAPTER 1
INTRODUCTION

1.0 Preamble

In a society, farmers are the providers of food for the people and thus constitute the most important group. Farmers live in rural areas and are occupied with farming activities. The type of crops cultivated by these groups varies in States and countries depending upon the environmental conditions of the geographical area. It is understood that one third of the earth’s land area is used for agriculture. Due to rural activities, renewable resources are produced at one side, while at the other side, the earth is too much exposed to misuse and wrong management. Even though there has been an increase in agricultural production when compared to previous years in some regions, this has been surpassed by increase in population and decline in commodity prices. Hence, care should be taken to preserve natural resources for complying with the sustainability of agricultural production systems and follow “farmer-centered approach” for achieving production sustainability both in developed and developing countries (United Nations Environment Programme, 2015).

1.1 Historical background of Agriculture

Agriculture is the science, art, or practice of nurturing the soil, producing crops, and rearing livestock and preparation and marketing of the harvested products. It has its origin since the development of mankind where the cultivation processes for production of food, feed, fibre, fuel and other commodities began by the systematic breeding of plants and animals. Before the cultivation of plants, men were hunters and food collecting people. Archeological evidences showed that more than 10,000 years ago, when people acquired knowledge and skill to care for soil and cultivate
plants, development of human society began and clans and tribes started to live in groups in particular geographical locations. This has led to the development of agriculture, cities and trade relations between places and people as well as between human societies and cultures. Hence, agriculture has become the source of economy all through centuries before and after industrial revolution. But, sustainable development in the supply of food worldwide necessitated the survival of good species and imposed farmers and government to adopt agricultural methods in synchronization with the environment (New World Encyclopedia, n.d.). But, it is found that due to various types of natural calamities, emptying of soil from rivers, lakes and cutting of trees for constructing buildings and factories, the ecological balance of earth went upside down, leading to global warming and destruction of crop production. This environmental imbalance has affected the agricultural production within states, countries and outside nations in varying levels.

1.2 Importance of Information Systems in Agriculture

Information in agriculture is very critical for industrialized as well as developing countries. For the success of any development programme, access to timely and accurate information is very crucial. According to United Nations Centre for Science and Technology, “the distinction between information “haves and have-nots” is the base for the dichotomies among “developed and developing” and “rich and poor” and it should be based on this concept that development may be studied in the terminology of information”. According to Economic Commission for Africa, “information poverty of developing countries is reflected in their rural development activities due to the following factors:
• Rural communities face difficulties in getting right information in right time

• Most of the information is available in written form, so less educated and illiterates find it difficult to access these.

• Sharing of information and experience is carried out among themselves by rural communities in face-to-face manner

• As indigenous knowledge is not documented and stored, it gets lost and is not transferred for use by future generations

• Policy decisions by government officials are framed based on inadequate information and there is no financial control and monitoring mechanism in the execution part

• Communication service facility provided to rural areas is not efficient, making it difficult to communicate up to date information to the farmers.

Hence, it is clear that rural development can be implemented only if information on agriculture is communicated to farmers in the form and language they understand. Without this, all other efforts for development will be in vain. Hence, for transferring information among small and medium farmers in rural community, Information Technology is an important tool, for getting more results. For this, entrepreneurs in remote areas should be connected through proper networking (Zijp, 1994).

In most cases, farmers are not able to access information on their specific needs and they try to use conventional methods to rectify their immediate problems faced in farming practices, which makes them difficult to get better yield from
cultivation leading to unsteady growth in agricultural production (Abraham, Ganesan & Sujatha, 2014).

Agricultural information is indispensable for the empowerment of farmers for increasing agricultural production by the use of modern technology in their own or in other’s farms and to access innovative technologies which will help them to connect with organizations for accessing resources and technologies for enabling them to sell their products in markets without interventions of middle-men and strengthen the organizations of farmers, for which ICT has an important role (Uphoff, 2012). Hence, Agricultural Information System works as mechanisms to provide information through extension, research, education and serve farmers to take better decisions in farming activities. Thus, for the better utilization of its services, it is highly essential to understand the working of the concerned Agricultural Information System (Demiryurek, Erdem, Ceyhan, Atasever & Uysal 2008).

1.3 Development of Agriculture in India

According to India Brand Equity Foundation, agriculture, fisheries and forestry are the India’s largest contributors to the Gross Domestic Product (GDP) and the GDP of agriculture and allied sectors in India was logged as US$ 259.23 billion in financial year 2015. With regard to spices and its products, India is the largest producer, consumer and exporter in the world and second largest in fruits production and third in farmstead and agricultural outputs. Agricultural development in India is managed by the Department of Agriculture and Cooperation under the Ministry of Agriculture. For the development of other allied sectors, it works in association with other bodies which include National Diary Development Board etc. (Indian Brand Equity Foundation 2016).
The climatic conditions and agricultural practices followed in India have a direct impact on the yield of crops in India. There are mainly 9 types of agricultural practices followed in the country such as subsistence farming, shifting agriculture, plantation agriculture, intensive farming, dry agriculture, mixed and multiple agriculture, crop rotation, sedentary cultivation or permanent agriculture and terrace cultivation. By adopting plantation agriculture, intensive farming, mixed and multiple agriculture, crop rotation, sedentary cultivation, terrace cultivation practices, high level productivity of crops are possible since these types of cultivation are carried out using sophisticated equipments in places where there are plenty of rainfall and irrigation facilities. But through subsistence farming, shifting agriculture, dry agriculture etc. only very low productivity of crops is possible due to the use of primitive cultivation methods and scarcity of rainfall irrigation facilities (Ghosh, n.d.)

There are many growing challenges faced by farmers like availability and accessibility of life components like food, clothing, health facilities, capital generation, lack of storage and agrarian facilities, equality in availing these benefits, lack of infrastructural facilities, erratic price system, emerging risks like pests and diseases, Genetically Modified (GM) crops and liberalization through World Trade Organization (WTO). Hence, agriculture in India has become a complex process based on these agro, economic, environmental and global issues (Seetharaman, 2016).

Agricultural statistics of India reveal that instead of food sustainability, India’s graph is showing a decline in productivity rate. It is understood that the agricultural machinery and methods used by farmers in India are in most cases primitive, crude and obsolete that slow down the agricultural productivity. When
modern farm equipments and methods are adopted in agriculture, it will not only save
time, reduce cost of production and also enable to increase productivity. Hence, even
small scale farmers can prefer to use these equipments for saving time and money
(Tripathi & Prasad, 2010)

Another important challenge for applying modern technologies in fields are
due to the level of information literacy of farmers, their desire to learn and
availability of learning facilities. In this regard, establishment of rural public libraries
network will be helpful in the provision of sufficient learning facilities, information
literacy and transfer of agricultural technologies to farming communities (Khanna,
2007).

If the innovative technologies do not reach the farmers, the researches carried
out in the area of agriculture cannot attain its goals. For this, the extension activities
should be more efficient. Hence to overcome the above challenges, the establishment
of effective Agricultural Information System is highly essential to transfer the
technologies to the farmers in an improved manner.

1.4 Agriculture at State level

Kerala is a state has 14 districts with 75 Taluks, 21 Revenue divisions, 1664
Revenue Villages, 991 Panchayats, 5 Corporations and 53 Municipalities and 152
Community Development Blocks. The state is having an average rainfall of 2900
mm. The per capita land of the State is 0.12 h.a. and per capita production of food
grain is 21.6 kg. There are 7359 “Padasekharams”, 1409 “Kurumulaku Samrakshana
Samithies” and 1581 “HarithaSanghams” functioning in the State (Department of
According to Census 2011, the population of Kerala is 3,33,87,677 in which, 740403 (7.2%) are cultivators (Prokerala, n.d.).

In Kerala, research activities in agriculture are carried out in five zonal research stations across west coast plains and Ghats region under Kerala Agricultural University. The Table given below shows the list of zonal research stations with crop information (Department of Agriculture and Cooperation, n.d.). Kerala’s map is also given below providing information on agro-ecological zones of Kerala (Kerala Agricultural University, 2011).

**Table 1.4.1 Five Zonal Research stations across west coast plains and Ghats region**

<table>
<thead>
<tr>
<th>NARP Zone</th>
<th>Zonal Research Station</th>
<th>Districts</th>
<th>Suitable Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-1 Northern Zone</td>
<td>Pilicode</td>
<td>Malappuram, Kozhikode, Kannur and Kasargode comprising coastal</td>
<td>Rice, Coconut, Banana, Tapioca, Cashew, Pepper, Seasamum, Rubber, Ginger, Mango, Jackfruit, Cocoa, Cardamom, Vegetable</td>
</tr>
<tr>
<td>KE-2 Southern Zone</td>
<td>Vellayani</td>
<td>Thiruvananthapuram, Kollam, Pathanamthitta, Alleppy and Kottayam</td>
<td>Rice, Coconut, Banana, Tapioca, Cashew, Pepper, Seasamum, Rubber, Ginger, Mango, Jackfruit, Cocoa, Cardamom, Vegetable</td>
</tr>
<tr>
<td>KE-3 Central Zone</td>
<td>Pattambi</td>
<td>Palakkad, Thrissur and Ernakulam excluding the high ranges</td>
<td>Rice, Coconut, Banana, Tapioca, Cashew, Pepper, Seasamum, Rubber, Ginger, Mango, Jackfruit, Cocoa, Vegetable</td>
</tr>
</tbody>
</table>
KE-4 High Altitude Zone
Ambalavayal
High ranges of Wayanad, Idukki, Palakkad, Kollam and Thiruvananthapuram
Rice, Pulses, sugarcane, Palmyra, Pepper, Cardamom, Areca nut, Cashew nut, Tapioca, Drumstick, Coconut, Rubber, Mango

KE-5 Problem Areas Zone
Kumarakom
Onattukara, Pokkali and Kote
Rice, Tapioca, Banana, Mango, Jackfruit, Sesame, Coconut, Sugarcane

(Source: Centre for Land Resources, Research and Management)

Figure 1.4.1 Agro climatic zones of kerala

In Kerala, the growth of agriculture and allied sectors is found to be fluctuating throughout the Plan Periods. It showed a positive growth of 1.8% in the
Xth Plan Period, but a negative growth rate of -1.3% in the XIth Five Year Plan. As per the statistics of Directorate of Economics and Statistics (DES) in 2011-12, agriculture and allied sectors showed a positive growth rate of 1.43 percent in the first year (2012-13), but in the second year (2013-14), it showed a negative growth rate of -2.13 percent. In the next year 2014-15, it recorded a negative growth of -4.67 percent. Hence, the share of agriculture and allied sectors in total Gross State Domestic Product (GSDP) of the state reveals a decrease from 14.38 percent in 2011-12 to 11.6 percent in 2014-15. In this regard, Government of Kerala has formed a Task Force with Vice-Chairman, State Planning Board as Chairman and Government Secretaries as members to revitalize agriculture and allied sectors (State Planning Board, 2016).

### Table 1.4.2 Share of agriculture and allied sectors in total GSDP of Kerala

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Year</th>
<th>Share of agriculture &amp; allied sectors in GDP (India)</th>
<th>Share of agriculture &amp; allied sectors in GSDP (Kerala)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2011-12</td>
<td>18.4</td>
<td>14.38 (9.1)</td>
</tr>
<tr>
<td>2</td>
<td>2012-13</td>
<td>18.0</td>
<td>13.76 (9.5)</td>
</tr>
<tr>
<td>3</td>
<td>2013-14*</td>
<td>18.0</td>
<td>12.9 (8.83)</td>
</tr>
<tr>
<td>4</td>
<td>2014-15**</td>
<td>NA</td>
<td>11.6</td>
</tr>
</tbody>
</table>

*Provisional  **Quick # figure with 2004-05 base in brackets

**Source:** Directorate of Economics and Statistics

Department of Agriculture, Government of Kerala is concerned with designing and implementation of different programmes to support production of food and cash crops in Kerala. Major activities of the department are promoting scientific methods for cultivation, plant protection, supplying of quality seeds, seedlings,
chemicals for plant protection and materials for planting etc. Policies and projects for
the benefit of farmers are designed and framed under the department. Agricultural
Research, Education and Extension are the three main functions of the department
(Government of Kerala, n.d.).

To revive the growth of agriculture and allied sectors, many schemes were
introduced by the department in 2015-16 such as promotion of organic farming
production, distribution of quality planting materials, cultivation of fallow land with
collective participation, Agricultural Technology Management Agency (ATMA) plus
model of extension, rejuvenation of spices economy, crop health management
covering surveillance of pests and diseases, safe food production and integrated pest
management, institutional mechanism for marketing and development of farmer
markets, comprehensive crop insurance for paddy, Global Positioning System(GPS)
enabling soil sample collection and issuing of soil health cards, establishment of two
new Mobile Soil Testing Labs (MSTL) at Kasaragode and Pathanamthitta, agricards
on a pilot basis at Kalliyoor Grama Panchayat and 15 Agro Service Centres and 59

Several Rural Development Programmes such as Mahatma Gandhi National
Rural Employment Guarantee Schemes (MGNREGS), Indira AwasYojana(IAY),
Rural Infrastructure Development, Pradhan Mantri Gram SadakYojana (PMGSY),
Integrated Watershed Management Programme (IWMP), Swachh Bharat Mission
(Gramin) and Kudumbashree Mission and Alleviation of Poverty have also been
initiated with an aim to reduce poverty, creating employment, developing rural
infrastructure and providing basic services to farmers. The department provides
information regarding the above schemes and services to farmers through Krishi
Bhavans at Panchayat level as part of agricultural extension activities of the State
(State Planning Board, 2016). Krishi Bhavans also provide required information to farmers using web-technology, mobile SMS based advisory services, video on demand service etc.(Krishi Bhavan Kadukutty, n.d.).

Kerala Agricultural University is the main institution for providing human resources, skills and technology needed for the sustainable agricultural development. It deals with agricultural crop production and forestry which involves integrating education, research and extension activities (Kerala Agricultural University, 2013). Directorate of Extension under the University design “Extension Education Programmes” for transferring research information to farmers and other stakeholders through government departments concerned. Its activities on “extension education” are executed through “Communication Centre, Farm Advisory Service, Central Training Institute, Advanced Centre of Training in Plantation Crops, Krishi VigyanKendras and Village Adoption Programme” along with “educational institutions and research stations of the university”(Directorate of Extension, 2015).

As part of providing support to agricultural related activities, KrishiVigyanKendras were established in 1992 by ICAR. Towards this, almost 200 Krishi VigyanKendras (KVKS) in the country were linked via VSAT Hub and Education and Research Network (ERNET) connectivity. This will function as “information hub” for storage and retrieval of agriculture information and advisory facility to the farmers (Agromedia, 2013). In Kerala, there are KVKS established in all the 14 districts of Kerala which are hosted by State Agricultural University (SAU), ICAR and by NGOs established at different centres and periods (CMFRI, n.d.).

In Kerala, Non-Governmental Organizations (NGOs) conduct various programmes on employment, agriculture, rainwater harvesting, animal welfare, science and technology, sports, development of art, craft and culture, heritage
protection, conservation of historical places, social equality, drinking water, legal awareness and aid, nutrition, right to information, rural and urban development, forming and supporting self-help groups, research and development activities etc. (Kerala NGOs, n.d.). Kerala Agricultural Development Society (KADS) is a non-governmental charitable organization developed for the enhancement of farmers in Kerala. The objectives of KADS are to protect fair price for agricultural products without intervention of middle-men, promoting production of quality products through organic farming, sustaining natural resources through campaigning and application of eco-friendly agriculture. Production and marketing of all spices, dairy products, bio-fertilizers and pesticides and value added products are included for development under its activities (KADS, n.d.).

1.5 Global and National level advancement

1.5.1 Global level

Growth of information in agriculture and related science is tremendous and due to this information explosion, agricultural scientists, information scientists and librarians are facing many challenges to sort out relevant information as per contextual requirements. This has been a phenomenal experience of professionals world-wide until the establishment of an International Information System for Agricultural Sciences and Technology (AGRIS). It is the first international cooperation project established in the field of agriculture by Food and Agricultural Organization (FAO) of United Nations with the cooperation of several countries, with participation of 146 national, 25 regional and international centres. On the basis of this, in India, Agricultural Information Centre (ARIC) has been established by Indian Council of Agricultural Research (ICAR) due to strong demands from agricultural scientists.
ARIC acts as the “central information source” for nature, location and status of current research projects conducted in India and the “national focal point” for “SAARC Agricultural Information Centre (SAIC)” (Kendadamath, 2003).

1.5.2 National level

Under Ministry of Agriculture, Government of India, there are two major departments such as Department of Agricultural Research and Education (DARE) and Department of Agriculture and Cooperation (DAC). Under DARE, the institutions included are Indian Council of Agricultural Research (ICAR) and KVKs. Major divisions like Directorate of Extension and Directorate of Marketing and Inspection (DMI) are grouped under DAC (Government of India, n.d.).

DAC takes care of the development of agriculture sector and development of allied sectors in India with the help of “National Diary Development Board (NDDB)” working under it. During 2016-17, Government of India has proposed various schemes for sustainable development of agriculture, research and development, Rural Infrastructural Development Fund (RIFD), long-term rural credit fund, short-term cooperative rural credit finance fund, short-term Regional Rural Bank (RRB) refinance fund etc. towards agricultural development of the country (IBEF, 2016).

1.5.2.1 Initiatives at National level

i. Agricultural Resources Information System (AgRIS)

Under Department of Agriculture and Cooperation (DAC), AgRIS has been initiated as a central sector scheme for promoting Agricultural Information System in the country. It has been established as an e-governance programme for nurturing growth of agriculture, reduction of poverty and usage of sustainable resources in the country at the lower level. It also serves as a step towards introducing a location
specific e-governance model for the poor. The execution of the project has been carried out by Agricultural Informatics Division of National Informatics Centre (Government of India, n.d.).

ii. National Agricultural Research System

National Agricultural Research System (NARS) in India is the largest agricultural information research system in the world. After independence, several important changes have occurred in agricultural sector. As a result, in 1965, ICAR has been identified to conduct research activities in crops, commodities, animal sciences and fisheries. In 1973, Department of Agricultural Research and Education (DARE) has been set up under Ministry of Agriculture for providing ICAR with essential linkage with central and state governments. The present system of NARS is very large consisting of 30,000 scientists and more than 100,000 supporting researchers. The organization of NARS consists of two main streams like ICAR at national level and Agricultural Universities at state level. Also other agencies like "Conventional/General Universities, Scientific organizations and several Central Ministries/Departments and private/voluntary organizations" are involved in agricultural research activities (Balaguru, 2015).

iii. Indian Council of Agricultural Research (ICAR)

Indian Council of Agricultural Research (ICAR) is an autonomous institution under DARE, Government of India with headquarter at New Delhi. It has developed a project called ARIS during Eighth Five Year Plan. There are a wide range of Agricultural Research Information Systems (ARIS) namely Agricultural Research Personal Information System (ARPIS), Agricultural Research Financial Information System (ARFIS) & Agricultural Research Management Information System.
(ARMIS) functioning in the ARIS network, known to be ARIS Network (ARISNET). NARS, which has been funded by World Bank under National Agricultural Research Project (NARP) is meeting the needs of farming community through its vast network of 30,000 scientists working at ICAR’s 49 Central Institutes, 6 Bureaux, 25 Project Directorates (PDs), 17 National Research Centres (NRCs), 79 All India Coordinated Research Projects (AICRPs)/AINPs, 607 KVKs, 52 State Agricultural Universities (SAUs), one Central Agricultural University (CAU), 4 Central Universities with faculty in Agriculture, 120 Zonal Research Stations (ZRS), numerous (1000+) regional stations and other research centres (ICAR, 2012).

In the present scenario, the library and information system of Kerala Agricultural University, its affiliated colleges and Research, CSIR institutions and Department of Agriculture under State Government are catering to the information needs of farmers (Sreenivasulu & Nandwana, 2001). Kerala Agricultural University has a special section called Farmers’ Division functioning in the library at the headquarters. Reading materials specially prepared for farmer community are provided to farmer members of the library and video programmes, interactive multimedia programmes, exhibitions etc. are conducted as part of the services of the division (Kerala Agricultural University, n.d.).

Recent initiatives of ICAR includes launching of various programmes like “Farmers FIRST, Student READY, Attracting Retaining Youth in agriculture (ARYA), Agri-Tech Froresight (ATFC) and MeraGaon, Mera Gaurav” programmes for establishing free enterprises among the agricultural graduates and technology delivery and for inducing knowledge liberation (DARE-ICAR, 2015).

1.6 E-Portals in Agriculture
E-portals in agriculture are the digital information platforms providing comprehensive information on agriculture, developed by different agencies such as governmental, non-governmental organizations, NGOs and individuals which has incorporated several modules for enabling smooth operation of the portal. These portals helps the agricultural users to access their required information by clicking on the particular options. Most of the e-portals are interactive, so that the end-users can have direct contacts with experts in the field.

1.6.1 mKisan portal

mKisan is a Short Message Services (SMS) portal created for providing information/services/advisories to farmers through SMS alerts in their own regional language under the National e-Governance Plan-Agriculture (NeGP-A) introduced as part of agricultural extension activities. The portal has been inaugurated by the Hon. President of India on July 16, 2013. There are about 8.93 crore families dedicated with agricultural occupation in Kerala. It is found that among other services provided by mKisan, mobile messaging is the most effective tool for transferring information to the farmer community (Govt. of India, n.d.).

1.6.2 Kissan project

Karshaka Information Systems Services and Networking (KISSAN) is an e-governance project launched by Government of Kerala on November 1, 2003 which provides beneficial information and extension services to the rural farmers in Kerala. KISSAN is defined as one of the leading citizen centric e-governance projects of the Department of Agriculture, Govt. of Kerala.
The project aims to provide right information to the right person in the right place and in the right context using various integrated technologies for the effective information utilization by the farmer community in Kerala. Important services of KISSAN are portal-based agri-advisory service, TV programme, online agri-video channel, tele-advisory services, SMS based agri-advisory services and mobile-based agri-information services (Dept. of Agriculture, Kerala, n.d.).

1.6.3 ATMA Kerala

ATMA scheme was started during 2005-06 by Government of India as part of agricultural extension reforms in the country. ATMA is now functional in 639 districts and was revamped during 2010. The scheme has integrated the problem solving skills of KVKs and the feedback received from farmers to SAUs and NARS to plan activities in the district level with the help of technology for improving the living standards and earnings of rural farmers. The scheme aims at making the agricultural extension system as “farmer driven” and “farmer accountable” by distributing technology to farmers. For making the scheme as “farmer driven” and “farmer accountable”, ATMA has been set up at district level, block level and village level to operate the extension reforms on a “participatory mode”. As State governments have the freedom to opt their preferred type of agricultural activities, the system is named as “ATMA Cafeteria” (“ATMA Kerala,” 2013).

1.6.4 E-Krishi project

E-Krishi project of Government of Kerala was launched in 2006 by Information Technology (IT) State Mission, Kerala in coordination with Kerala Agricultural department and National Institute for Smart government (NISG). The project has been launched through two e-governance projects such as
Akshayacentreinitiative and KISSAN launched in 2002 and 2003 respectively. E-Krishi website has several sections such as "Online Trade Portal", "Online Advisory", "Offline Material", "Call Center", "E-Krishi Training" which provides facilities for internet marketing, direct communication with agricultural experts, receive booklets, magazines in regional language on agricultural and allied topics etc (Haijun, Weifeng, Jinghua & Rong, 2015).

1.7 Use of Agricultural Information by rural farmers

Farmers in Kerala are facing many challenges such as high costs in agricultural inputs, climatic variations, lack of irrigation facilities, electricity supply, availability of good variety seeds, damage of crops due to diseases, attack of pests etc. Even if the farmers are hardworking, they are not able to achieve gains from their cultivation. The impact of globalization has led to enhancement of foreign currency to the nation. At the same time, advancement of ICT has made it easy to access agricultural knowledge generated by State, Centre and the world. In spite of existing facilities, farmers are not adequately utilizing the modern technologies and information generated in the agricultural sector available in various sources. This happens because of the lack of proper policy on the part of administrative machinery to exploit maximum use of the existing infrastructure, identify gaps and execute steps to urgently solve the barring issues. Lack of information literacy among farmer community is one of the main reasons for the low utilization of information, which needs to be addressed by conducting intensive agricultural extension programmes. The potential use of ITC’s e-Choupals (Indian Tobacco Corporation) in rural India is a strong evidence for this (Chatterjee & Dasgupta, 2016).
1.8 Flow of Agricultural Information

In Agricultural sector, people exchange information among individuals and groups. Through communication, the information gets transformed and enables better understanding. According to Abraham Blum, there are four levels in the flow of information in agricultural sector, from knowledge policy making to knowledge generation, knowledge exchange and knowledge utilization (Blum, 1997). The figure depicts Information flow in the context of Kerala State.

(Source: Raman Nair, R.An investigative and evaluative study of factors affecting quality of agricultural and farm information services in Kerala)

Figure 1.8.1 Flow of information in agricultural sector

As per the figure, information from national and international organizations received at first level such as agricultural organizations and departments of Government of Kerala, where knowledge policy is formulated. From there, it flows to
the second level such as research, development and teaching institutions, where knowledge is generated, based on the knowledge policy. From there, it reaches to third level such as Farm Information Bureau (FIB) and Krishi Bhavan for providing extension and communication activities, where the exchange of knowledge takes place. From there, it flows to the fourth level, the end-users who are the farmers, where the knowledge is utilized for its effective application on farms for increasing the productivity of the State. There is a need for repackaging of information according to the needs of farmers for proper utilization. For which, feedback from the end-users is highly essential. Hence, feedback from farmers is collected by the FIB and Krishi Bhavans and communicated to the higher levels accordingly for making necessary modifications.

In agricultural sector, information is generally used by three categories of users like Managers, Scientists and Farmers. Manager category of users are decision makers like Vice-Chancellors, Directors, Secretaries of Kerala Agricultural University, Indian Council of Agricultural Research, Institutions, Departments of Agriculture, Animal Husbandry, Poultry, Fisheries, Diary Science, Food and Rural Development of State Government, Non-Governmental Organizations and Private firms. Their responsibility is decision making and type of information they require include manpower, infrastructure, conducting research, extension and development projects, fund allotment and physical targets.

Scientist are category of users is those who are placed in research centres in the State under ICAR, agricultural universities and extension wing of Department of Agriculture. The information requirements of this category are trends in research and extension in agriculture and related sciences, genetic resources of plant, animal, fisheries, nature of soil and natural resources, agro weather aspects, economic and
social indicators, farm feedbacks and earlier research outputs both at national and international levels.

Farmer category is the most important category of users belong to the beneficiary end-user group. Their requirements comprise prices for the input as well as output materials, information about market price, improved variety of seeds, farm machinery, cattle breed, fish etc., modern techniques and methods of cultivation and preventive measures to crop diseases (Raman Nair, 2006).

But in real situation, it is found that the farmers face different types of constraints in accessing information on the developmental changes taking place in agricultural sector. Due to this, the agricultural production of the state is affected to a large extent. Poor marketing facilities and selling platforms are a few constraints for surplus agricultural yield. Some of the other important constraints in marketing are high cost for transportation, poor roads, improper handling, poor storage facilities and wastage. These lead to variations in both productivity and financial benefits (Alila & Atieno, 2006).

Even with the availability of provisions for accessing agricultural information through various sources and centres, the rural farmers still appear to lack information relevant to them.

1.9 Need for developing a prototype model

For increasing productivity, quality information should be induced by Scientists and Managers. Hence, a systematic and effective R & D programmes with an updated information support system is required. In Kerala, the library and information system of Kerala Agricultural University and its affiliated colleges,
ICAR and its institutions and Agricultural Department of the State Government are trying to satisfy the information needs of the farmer community.

Studies revealed that when farmers get the right information in the right time through efficient AIS, they become empowered through control over their resources, which help them to take better decisions for improved agricultural production, processing, trading and marketing (Maningas, 2005). According to Food and Agricultural Organization (FAO), information is very important for increasing agricultural production than material inputs like seeds and fertilizers, since it has direct impact over the betterment of income and livelihood of farmers. Only if the newly generated technology reaches the farmers immediately through various advisory services, these can be applied in their farms for increasing productivity. But this system is often not working properly in Kerala and other states as well, due to the weak linkage between research and advisory services, resulting in the slow adoption of these technologies by the farmers. In this regard, FAO recommends that information systems that integrate farmers, agricultural educationists, researchers, extension workers and farmers have to be developed, which will serve as “facilitators and communicators” to help farmers in decision making and adoption of new technologies for sustainable agricultural and rural development (FAO-GTZ, 2006).

In Kerala, it is seen that even though Government is investing huge amount of money for conducting research and developmental activities in agriculture and related sectors, the state is still not able to attain food security. Hence, the state is forced to depend on other states for agricultural products. The main reason is lack of effective mechanism to transfer right and comprehensive information in the right time to the rural farmers that prevented them to take right decisions regarding cultivation, harvest and finance (Raman Nair, 2006). In this context, the researcher found it important to
develop a prototype model for transfer of right and comprehensive Agricultural Information System. Through this study, the researcher has tried to develop a comprehensive information system generated from 3 main components such as Department of Agriculture, being the apex body in agriculture of the State, NARS, being the largest Agricultural Research System of the nation and the digital information portals of Central, State Governments, NGOs and various national and international databases on agriculture.
References


http://forge.fh-potsdam.de/~IFLA/INSPEL/01-4srva.pdf


