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AGRI-Life

Transfarming agriculture in Bundelkhand through rainbow revolution...

Integrated Farming System and Agri Tourism

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From Vice Chancellor's Desk.....

The Indian economy is chiefly agrarian, with small and marginal farmers being the core of the Indian rural economy, constituting 85% of the total farming community while holding only 44% of the total operational land. Operational agricultural holdings are still declining in India. Since the last four decades, the average landholding size has decreased three times its size. In contrast, land resources available for cultivation have more than doubled in Andhra Pradesh, Karnataka, Madhya Pradesh and Maharashtra owing to limited population pressure.

The marginal farmers with small holdings focus only on crop production, mainly cereals, under high risk of flood and drought. Due to the failure of the monsoon and small-size holdings, they do not get enough income to maintain their family. Also, being labour-intensive, Indian agriculture requires a lot of manpower and energy, and despite ceaseless toiling, farmers, especially the marginal ones, are not in a position to earn their livelihood from the meagre sums left after paying all the costs. The declining trend in per capita land availability threatens the sustainability and profitability of farming. A serious challenge to agriculture since the Green Revolution is the shift of most farmers' focus to single enterprise-based farming systems, resulting in poor soil health, increased risk of crop failure and declining productivity. The need of the hour is to meet the demands of the growing population without causing harm to the environment. Integrated farming systems are a potential solution to the ever-increasing demand for food production, income stability, and nutritional security, especially for small and marginal farmers. It is not only a reliable way to achieve fairly high productivity with a substantial fertilizer economy but also a concept of ecological soundness, leading to sustainable agriculture. The emergence of an integrated farming system has provided us with an extensive framework for an alternative development model for improving the viability of small-scale agricultural operations. Integrated farming systems are agricultural systems that integrate livestock and crop production or fish and livestock systems. They are sometimes referred to as integrated biosystems. Under these systems, an interrelated set of enterprises enable waste from one component to become an input for another enterprise, thus reducing costs, boosting production and increasing income.

Agritourism is a form of niche tourism that is considered a growth industry in many parts of the world, including Australia, Canada, the United States, Sri Lanka, and the Philippines. Agritourism, the newest concept in the Indian tourism industry, usually focuses on farms. It allows the tourists to experience enchanting and authentic contact with rural life, taste authentic local food and get acquainted with the various agricultural operations during the visit. Tourists can relax in the pristine natural environment, which starkly contrasts the complexities of busy urban lifestyles. The urban population is increasing day by day. The world of urban children is confined to closed-door schools, classrooms, cartoon programs, television, video games, computers, the internet, chocolates, soft drinks, spicy fast food, etc., and they see mother nature only on television screens. Also, 35% of people in cities do not have relatives in rural areas, and 43% have never visited or stayed there. Agriculture as a business is becoming increasingly expensive, and many farmers cannot afford it. In addition,soil fertility is gradually losing, leading to declining yields. Unless farmers start some form of business to supplement and support their income from the land, they are doomed to live below the poverty line. Agri-tourism includes opening farms to tourists from urban areas and abroad and letting them experience rural life. Besides teaching them about different crops and how they are sown and harvested,

agritourism introduces tourists to traditional food, handicrafts, culture, music and language. Tourist Village Experience activities like bullock cart ride, milking of cows and goats and picking fresh fruits and vegetables from the farm.

The university is also working on an integrated model for setting up agri-tourism centres in Bundelkhand. In the coming years, the efforts made in this direction will be fruitful, and the farmers of this region will be motivated to develop such models of overall development. The excellent articles included in this issue by Chief Editor of Krishi Jeevan Prof. Anil Kumar and the entire editorial board will be inspirational for the readers.

(A. K. Singh)
Vice Chancellor

Editorial

Intergraded farming System and Agrotourism and: A consistent development option

Achieving sustainability and profitability in Indian agriculture is a serious challenge due to climate change scenario and continuous reduction in land holdings. In the year 1970-71, the average land holding was 2.28 hectares, which has reduced to only 1.08 hectares in the year 2015-16. If this trend continues, then by the year 2030 the land holding will reduce to only 0.32 hectares (Agriculture Census, 2010-11).Agriculture is the mainstay of the Indian economy, because it is the main source of rural livelihood security, and it also has the responsibility of discharging the food and nutritional security of about 139 crore Indians. In the era of climate change, it is extremely important to develop adaptive agricultural strategies to ensure adequate employment and income generation for small and marginal farmers, as they constitute 85 percent of the farming community.In traditional farming systems, their cultivation costs and the risk of crop failure are so high that farmers are not able to recover even the money spent. Under the present scenario, "Integrated Farming System and Agrotourism" is proving to be a successful option to make agriculture more profitable, capable of generating employment and maintaining stability in income.

Due to the continuously increasing population and decreasing natural resources, farmers also need to change both their methods and techniques. This is also known as Integrated Farming (IFS) model. It is known as Integrated Farming in English. This is a modern technique of farming. In this technique, along with farming, horticulture, animal husbandry, poultry farming and fisheries are promoted.This helps a lot in increasing the income of farmers. In simple language, integrated farming includes all the components of farming. Due to which farmers continue to earn income throughout the year. In this technique, along with their main crops, farmers do poultry farming, fisheries, beekeeping, silk, vegetables, fruits and mushrooms together on the same land. In this one component is used for another component. With this, farmers can reduce their dependence on one crop or reduce the chances of their losses.

Integrated farming system is the integration of resources required for the prosperity of farmers such as integration of various crops (pulses, oilseeds, coarse grains and cereal crops) into agriculture, horticulture, animal husbandry, fodder production, fisheries, agro-forestry, beekeeping etc. makes proper combination. Due to the global Corona pandemic and climate change, activities related to agriculture and nutrition are on the verge of change according to both farmers and consumers, which is paving the way for mixed farming activities and safe nutrition.

The main benefits of agritourism in the era of globalization are stability of rural communities, protection of India's cultural heritage, employment generation in villages and increase in income of farming community. Along with all these benefits, agro-tourism also includes economic and non-economic benefits such as quality improvement in the lifestyle of farmers and consumers, nutritional security along with improvement in the environment. Agri-tourism is an emerging market segment of the tourism industry.The global agri-tourism market was valued at $42.46 billion in 2019 and is expected to reach $62.98 billion by 2027, growing at a compound annual growth rate (CAGR) of 13.4% between 2020 and 2027. Agritourism in India came into existence in 2004 after Agri Tourism Development Corporation (ATDC), Baramati (Maharashtra).Agro-tourism is a direct marketing activity that provides additional opportunities for farmers to reduce the risks involved in agricultural activities through diversification in a competitive and urbanized economic environment. While farmers receive additional income from agro-tourism products by selling agricultural products to visitors, they develop their own identity, which is less risky than mere farming.Sustainable agrotourism is the use of all resources to meet economic, social and aesthetic needs while

maintaining cultural integrity, essential ecological processes and biological diversity.The concept of agritourism is known in various forms such as tourist farms, holiday farms, farm based tourism and rural tourism. Agritourism destinations offer experiences different from the traditional tourist destination packages such as information about agriculture related activities, rural life. Information about Indian culture, pollution free environment, organic and nutritious food, farm shops etc. are becoming popular due to the activities.

India is a country full of cultural heritage and biological diversity, due to which agri-tourism is not similar to other tourist destinations like mountains, beaches, rivers and other natural places, but is full of various cultural heritages, diverse traditional food items with region-specific nutrition, rural tourism. Due to its unique lifestyle, it attracts tourists.

It is a great pleasure to present the eighth issue of Krishi Jeevan magazine in the university's publication series. In this issue, valuable articles by scientists and students of various institutions will definitely contribute in providing awareness and employment opportunities to the readers about integrated farming system and agro-tourism.

(Anil Kumar)
Editor in Chief

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"Integrated farming system: A panormic view"

Nikita Maurya, Dr. Amit Kanawjia, Dr. Rakesh Kumar, Piyush Singh,

Abstract:

The ever increasing population of India is leading a warning to the Indian agriculture with the increasing demand for food, clothes and shelter has been a challenge. In India small and marginal farmers represent more than 86% of Indian families. Crops and livestock's cannot be seen as an individual and nowadays, crop + livestock's is the pre-dominant farming system exists in small categories of farms and fields affected to natures vagaries like flood, drought and other calamities problems. In agriculture it is possible through integrating appropriate farming system components having less space, integrated farming system is considered as a boosting tool and create a path to provide income, employment, nutrition and livelihood. IFS lead to sustainability and stability in farm by creating multiple enterprises with maximum consumption to meet farm and family needs.

Introduction

Integrated farming system is the composition of different enterprises like fish, dairy, poultry etc. with low cost and higher returns. It is the only reliable approach of obtaining both high productions with sustainability for a better utilization. In this farming system approach has been made to obtain the high farmers income The cultivation of crops under agriculture and horticulture basis plays an important role for the prosperity nationwide even under rough conditions. Integration of different enterprises modules in farming system leads in enhancing the productivity and profitability of the farming system. The natural resources can be explored to its maximum potential in a complimentary way so as to harvest maximum returns from the various enterprises of the system through integrated farming system.

Integrated farming system approach

IFS approach can be described as a judicious mix of two or more components with basic usual knowledge of minimum competition and maximum profitability with advanced management aiming for sustainable and environment friendly improvement of farm income, family nutrition and ecosystem services.

Objectives

1. Advancement in the sustainable approach of farmhouse holds system including several rural communities.
2. Improvement in the input efficiency for the farm production system
3. Fulfilling the basic needs of farmer families along with the nutritional improvement.
4. Enhacing the family income through optimum use of resources.

Family farming model having components

Agriculture based family farms are emerging as a potential solution to address the challenges of providing nutritional security and round the year availability. Family farming is a key for sustainability. Hence, leveraging the family farmers through integration of enterprises will make a difference in achieving nutrition security

A case study has been presented of BAU, Sabour, Bihar, which shows the potential of diversified farming systems in sustaining the livelihood and income of a farm family

A family farming model comprising of diversified cropping systems (0.78 ha)+ horticulture(0.14 ha) dairy 2 cows + goat 11 nos + fish 0.1 ha+ ducks 25 nos + boundary plantation (subabul 22 plants and moringa, 50 plants was developed for the south Bihar alluvial plain zone in middle gangetic plains region at sabour having one hectare area with five family members. The IFS model provided round the year income ranging between Ra 13,160 (September) to 51,950 (April)/ ha/month.

IFS in incresing farmers income

India has a diversified climate and agriculture is totally based on climate and monsoon. This can cause havoc or only this will leads in increasing farming potential. Majority of indian farming communities follow traditional norms of agriculture which support their livelihood. If a crop fails the input given, cost, production everything getst ruined so it starts with the strenghtning the cropping system with IFS for prviding assurance to

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farmers by having water, irrigation, nutrition, technology,skills, knowledge, awareness, potential to try new methods , using integrated nutrient and pest management, using HYV Seeds, reducing cost of products using biofertilizers and most importantly having crop+ dairy/poultry/fisheries etc.

IFS in womens empowerment

From the ancient times, womens have played an immense role both in the household and agricultural management mainly in the rural areas. To improve the condition one can use the family labour in implementing new and improved technology to imcrease better performace of the crop. This can be achieved by maintaning the skilled and trained womwn labour by providing them proper training and basic support where educatiuon is one of those thing that cant be neglected and that's when there will be transparent womens empowering nation.

IFS playing role in sustainable development

IFS contains several components such as crops, animal husbandry, agro forestry, horticulture, kitchen gardening, fisheries which are linked together for better farming and production and this is the start to develop better and assured sustainable production. Sustainibility helps to ensure the better utilization of components to fulfil the needs and to protect them for the future generation. This provides farmers of small scale a better approach of livelihood . farming under dryland area using crops and practices that can sustain drought condition will be helpful to provide a protected livelihood.

IFS to improve nutritional food security

India needs to take a big approach to increase food security as it tackles obstacles including water scarcity, small landholdings, water scarcity, low per capita income and improper irrigation. Malnutrition amongst children in india is high due to unavailbility of food despite being the second largest production of cereals, fruits and vegetables in the world and the reason can be concluded due to the inappropriate farming technique, and improper handling of grains and storage of fruits and vegetables. this increase the prevalent need of high yielding technologies in order to provide livelihood and food security to people of the region.

Advantages of IFS

- IFS increase productivity per unit area by virtue of intensification of crops and allied enterprises.
- Integration of different production system provides an opportunity to solve malnutrition problems in our country.
- It improves soil fertility and soil physical structure from appropriate crop rotation and using cover crops and organic compost. It also minimizes the nutrient losses.
- It provides higher net returns to land and labor resources of the farming family.
- There is also regular stable income through the products like egg, milk, mushroom, vegetables, honey and silkworm cocoons from the linked activities in integrated farming.
- It reduces weeds, insect pests and diseases through integrated pest management
- It reduces production cost of components through input recycling from the by-products of allied enterprises. The recycling of wastes for production helps to avoid piling of wastes and consequent pollution.

Challenges

- The increasing population on India is a threat as the need for the land is increasing day by day.
- The cost of the production, machinery and technology to be used are way expensive to the farmers having small and marginal landholdings.
- The newly developed scientific forces should be explained and demonstrated to the farmers so they can trust the newly interventions.
- Government should pay more attention to the sector to popularize the subsidies and different policies launched by them to help farmers.
- Natural resources can only be used to a limited extent and cost of transportation is way high.

Conclusion

Ifs is the most promising and reliable approach to maximize benefits. In a nutshell, it increases employment opportunities and integrated farming system fulfils the multiple advantages of making farmers self-reliable by ensuring the family members a nutritional security, improving the standard of living through maximizing the total net returns and provides sufficiency, minimizing the risk and uncertainties and keeping rhythm with environment. India has the rich diversity of climate, livestock, poultry, crops and horticulture. Utilization of our natural resources efficiently is very much important for appropriate crop rotation.

Spatial and temporal dimension of Agro- Tourism in Post-independent India

V.David Chella Baskar, P.P.Jambhulkar and Sundar Pal

Tourism is a significant economic and social endeavour distinguished by its interaction between humans and the land, which generates progressively more severe ecological and environmental issues. Agritourism facilitated the succession of agricultural enterprises from agricultural producers to their descendants. The employment opportunities generated by these centres have additionally benefited the villagers, as they elevate the social standing of cultivators and consequently enhance their standard of living. As an element of developing these tourism areas in a sustainable fashion, agrotourism contributes to the improvement of rural communities and the standard of living of their inhabitants by offering them supplementary sources of income.

Introduction

Agriculture is the primary sector that supports the Indian economy. Agriculture provides a livelihood for approximately 85 per cent of the population in India, either directly or indirectly, and accounts for nearly 26 per cent of the country's gross domestic product. Over 350 million tonnes of food grains are produced by 110 million farmers living in 0.625 million villages across the country. These farmers feed the nation. Agriculture in India is considered a cultural tradition rather than a job or a business. Adding new activities that generate income to those that already exist in agriculture would, as a result, almost certainly increase the contribution of agriculture to the national GDP. Several significant efforts are being put in this direction, and agritourism is one of the activities being considered. Agro tourism has spawned an offshoot known as agritourism, which has enormous potential in India because of the country's vast agricultural landscape. Agritourism is one viable option for developing nations like India and other Asian economies that rely heavily on agriculture as their primary source of income. This is because agriculture is the primary occupation of the majority of the population in these nations. Agritourism is just one of the ways that these nations can diversify their sources of revenue.

A visit to a working farm or any agricultural, horticultural, or agribusiness operations for enjoyment, education, or active participation in the activities of the farm or operation is an example of agricultural tourism. Agricultural tourism is a concept borrowed from the concept of "holidays." Agritourism, in its broadest sense, refers to the practice of luring tourists and vacationers to locations primarily utilised for agricultural purposes. Agritourism, on the other hand, is typically conducted on a modest scale, has a limited impact, and places an emphasis on education. Most of Maharashtra's farms are run by their landowners, meaning there are virtually infinite opportunities for individuality and customization. Numerous agritourism activities can be carried out successfully with only a modest number of farm workers. For instance, farm tours, bed and breakfasts, tractor or bullock cart rides, grapes, mangoes, and other horticulture farms, by-product farms, birds and animal zoos, and plenty of other activities can be run with little additional investment in labour.

People often refer to tourism as a tool for alleviating poverty, increasing employment opportunities, and fostering long-term human development. In 2017, the tourism industry was responsible for creating 21.5 million jobs. In addition to fostering national integration and international understanding, tourism provides financial support for regional arts and crafts and cultural pursuits. According to official statistics, 11.23 million people travelled to India from other countries in the year 2017. Even though India holds only 1.75 per cent of the global tourism market, the country brings in Rs 32,000 crores thanks to its participation.

Tourists make 120 million visits from within their own country. To foster domestic tourism, the Government of India has prioritised the development of infrastructure, product development and diversification, the creation of eco-adventure sports, cultural presentations in expensive accommodations, the streamlining of facilitation procedures at airports, the development of human resources, the promotion of public awareness and participation, and the felicitation of private sector participation.

Need and Importance of Agri Tourism

It is believed that participating in agrotourism is the best way to learn about traditional agricultural farming activities, which not only brings us much closer to mother nature but is also an extremely important component of

living a life that is compatible with the environment on this planet. The cities of India are currently struggling with the problem of overcrowding as well as environmental pollution. It is now commonly accepted wisdom that a break from the frenetic pace of life in urban areas can be had through the practice of agrotourism. Because of this, agrotourism, ecotourism, and rural tourism are quickly becoming some of the most important subsectors of the tourism industry in India. The vast majority of studies have conclusively demonstrated that agrotourism is of critical significance and is essential because One form of tourism that does not negatively impact the environment is known as agrotourism. The farmers now have access to an additional income source as a result. As a result, the rural way of life is elevated, and new employment opportunities are made available at the community level. Those who live in cities can take advantage of this to escape city life's hustle and bustle. Those who live in the area benefit from an improved quality of life as a result. The village atmosphere, local cuisine, culture, and art can all be experienced by tourists thanks to this. Rather than acting as a passive spectator, it anticipates that the tourist will actively participate in the activity, which helps to strengthen the connection between the guest and the host. It is environmentally friendly, which is important in the current environmental scenario. It acquaints tourists with rural life and the roots of early civilization. In the current climate of the tourism industry in India, it possesses a significant amount of growth potential. It is a less expensive tourism gateway, and the cost of accommodation, food, travel, and recreation is much less in Agro-Tourism when compared to any other type of tourism.

It broadens the tourist base by increasing the scope of tourism since it is cost-effective. In the current global scenario, there is a significant appetite for it. It provides all opportunities to people of all ages, including children, young people, middle-aged people, and older people, and it does so at a cost that is more affordable for the entire family. · It acquaints visitors with rural games, traditional clothing, festivals, and cuisine. It brings tourists closer to nature and offers them a variety of entertainment options to enjoy while there. It is a source of knowledge that can provide information about plants, animals, raw materials such as handicrafts and woods, the rural lifestyle, and the languages, culture, and traditions of the people who live there. This subset of the population may be able to have their inquisitiveness sated by participating in agrotourism, which typically centres on farming communities, rural settings, and agricultural pursuits. It is a way for tourists to consider agrotourism as a means of searching for peace and tranquilly in their vacations. · It brings tourists very close to nature, and the fields, birds, animals, mountains, and bodies of water, as well as the villages, provide a completely different atmosphere to the urban population, allowing them to forget about the busy and hectic life they lead in the city. Guests are allowed to travel to rural areas and spend time with their families as a result. It raises urban children's awareness of rural life and their knowledge of agricultural science, and it can be effectively used as an educational and training tool to educate urban tourists. It offers a wide variety of recreational opportunities to city dwellers by way of festivals and handicrafts.

Market for Agrotourism

The agritourism market is segmented into activity, sales channel, and region. On the basis of activity, the market is categorized into on-farm sales, outdoor recreation, agritainment, educational tourism, accommodations, and others. By sales channel, it is segregated into travel agents and direct. Region-wise, it is analysed across North America (the U.S., Canada, and Mexico), Europe (Germany, the UK, France, Russia, Italy, Spain, and the rest of Europe), Asia-Pacific (China, Japan, Australia, India, South Korea, and rest of Asia-Pacific) and LAMEA (Latin America, the Middle East, and Africa)

The on-farm sales segment accounted for approximately one-third half of the global agritourism market share in 2019, and it is anticipated to maintain its share throughout the forecast period. On-farm sales are an essential component of agritourism centres, as well as a significant source of revenue. On-farm sales of agricultural products like cattle, wine, and grapes are bringing in significant revenue for cattle farmers, wine breweries, and grape growers. To boost their earnings from the products they grow, some farmers have begun to operate their farm sales chain outlets. On-farm sales can include a wide variety of products, the specifics of which are determined by the farmer's production and the type of agritourism operation being conducted. Some examples of these products include grapes, apples, wine, goats, and rural antique showpieces. People are increasingly purchasing goods from on-farm sites because it is an incredible experience for them to pick farm products by hand and because the goods are fresh and have not been adulterated. On top of that, people are realising that buying goods from on-farm sites saves them money.

In projects of this nature, where the farmers are the focus of everyone's attention and the activities that are related to them emerge from there, networking is an essential component. Because having a good road and connectivity to the farms is very important, the suppliers of fertilisers and seeds can also act as tour operators to attract visitors from urban areas. These visitors would spread the word about the benefits of visiting the farms. On the other hand, the hospitable nature of the locals would encourage more tourists to visit the area and pave the way for improved distribution of the regional arts and crafts. Most city dwellers who take a day trip out to the countryside in search of a change of scenery do so in the hopes of contributing to the local economy by purchasing locally made crafts, which they then take home with them as a memento of their time spent there. The tour operators, the villagers, and the tourists are all connected to one another in some way, making them all part of the integrated communications strategy. The villagers, the majority of whom are farmers, can organise themselves into cooperatives to strengthen their faith in the viability of the agritourism model as an additional source of income and a more long-term way of life. Even when the monsoons are particularly harsh, the influx of tourists can help keep their income stable.

Furthermore, when there are a significant number of villagers in an area, many banks are more likely to be willing to offer assistance in the form of loans and other value-added services. Children tourists will benefit from the final window of farm recreation and the opportunity to purchase fresh farm produce because they will be able to comprehend the entire process while having fun with it. One of the most important aspects of sustainability is finding a solution to the problem of managing risks, which includes addressing issues such as delayed rainfall, pest epidemics, and death and loss of infrastructure. This is where the banks can come to the rescue.

Opportunities for agritourism challenges and its networking

Conclusion

Agritourism is a niche and emerging market segment of the tourism industry, and it has been gaining significant traction in urban areas. Urban areas have become increasingly interested in agritourism. This can largely be attributed to the rising popularity of farm stays as well as the growing interest among younger generations in rural life and agricultural pursuits. Due to the limited awareness that most people have regarding agritourism, ecotourism, and the other concepts that are closely related to it, travel agents in the agritourism industry play a significant role in the marketing and sale of agritourism packages. The majority of people may have participated in farm stays and activities. Still, they are unaware that these are examples of agritourism because this tourism industry sector has not yet been fully explored. In addition to selling vacation packages, travel agents educate customers about the various aspects of agritourism. This factor is expected to contribute significantly to the expansion of the market over the course of the period covered by the forecast.

Integrated Farming System – A sustainable management of natural resources

Ratnadeep Bhattacharya[1], YumnamBijilaxmi Devi[1] and Thounaojam Thomas Meetei[2]

Sustainable management of our natural resources whether it is land for agriculture, minerals, natural benefits being obtained for our mother nature, the most eminent of which is the natural benefits obtained from forests, etc. have led to involvement of sustainability in each and every aspect of our daily needs. In our agricultural point of view and aspect integrated farming system is one such way of sustainable management where a system is being created using coordination of more than one component which are matchable with each other or one component can derive benefits from the other component. The benefits being derived by the components can be either ecological; it can be a raw material for the other component or other else.The concept of integrated farming has been efficient in bringing sustainability in proper utilization of our resources. The concept of this innovative method of farming has been spread by means of various agricultural extension programs and besides models on integrated farming throughout the country to create environmental awareness among the farmers and thereby maximizing their revenue and income in the rural level through the state level to the national level. Integrated farming practice will help in sustaining natural resources like land, water etc. for future use.

Introduction

The dawn of the 21st century has been witnessing the rapid involvement of a popular term "sustainability" which scientifically means the utilization of our existing resources in a scientifically managed way as well as retaining for our future generations so that they can fulfill their demand and needs in a proper manner. Hence while utilizing the natural resources in a sustainable way, they will retain a part for their next generation and thereby ultimately a continuous series of sustainability will be involved.

Sustainable management of our natural resources whether it is land for agriculture, minerals, natural benefits being obtained for our mother nature, the most eminent of which is the natural benefits obtained from forests, etc. have led to involvement of sustainability in each and every aspect of our daily needs. In our agricultural point of view and aspect integrated farming system is one such way of sustainable management where a system is being created using coordination of more than one component which are matchable with each other or one component can derive benefits from the other component. The benefits being derived by the components can be either ecological; it can be a raw material for the other component or other else.

At present integrated farming system (IFS) has got various components to sustain the needs of the growing population. By means of following a chain or sequence where each and all components are being joined and the need of one component is being met by the other successive one integrated farming plays a major role in maintaining sustainability.Some of important components of IFS are Agroforestry systems and practices, Fisheries and aquaculture associated with poultry farming, Floriculture associated with poultry farming,Livestock rearing associated with agriculture where farm yard manure is being supplied by the livestock, Agroforestry system with sericulture, lac culture, Piggeries, Duckery, Crop production, Plantation crops etc.

The concept of integrated farming is an innovative idea where there is proper and efficient management of each and every resources thereby creating a concept 'there is no waste' and 'waste is only a misplaced resource'.Through this new innovative concept, the cost for the raw material of the other component is also saved as it is available from the previous component and the resulting output is also of superior quality thereby bringing an adequate and abundant market value.An example of floriculture associated with poultry farming can be taken where the owner of the poultry farm while rearing poultry birds including chicken, fowl, turkey, etc. on the other hand grows rose cultivation having rose of various colours. The excreta obtained from the poultry birds are being served to the plants as manure instead of adding chemical fertilizers. This has resulted in excellent and superior quality output thereby helping him to fetch maximum revenue from the market. Nowadays attention is being laid on growing crops using manures instead of chemical fertilizers. However, adding chemical fertilizer can bring growth within a short period of time but is not beneficial for the environment and the

[1]College of Horticulture and Forestry, RLBCAU, Jhansi
[2]School of Agriculture, ITM University, Gwalior, Integrated Farming System - the Concept

ecosystem.Hence integrated farming in this case besides being a cost effective also proved itself to be beneficial to the environment without harming the components of the ecosystem.

Other examples like farming system of fisheries and aquaculture associated with poultry farming has been found to be very innovative. The poultry birds are being reared on a compartment raised at a height above the waterbody (pond or lake) and the excreta obtained from these birds acts as source of feed supplements for the fish and the other organisms like crustaceans that is the crabs, molluscs, lobsters, prawns, algae, etc. Rearing fishes like *Gambusia affins* and *Poecilia reticulata* are also helpful in reclaiming the environment as these fish species feed on the mosquito larvae thereby helping to reduce the growth and spread of mosquitoes.Pig rearing in some parts have also proved to be beneficial as there is no need of supplying feed to the animal from outside since they generally feed on the wastes.

Agroforestry which is a land use system that integrates trees, crops and animals in a way that is scientifically sound, ecologically desirable, practically feasible and socially acceptable to the farmers can also be considered as in integrated system of using natural resources.In an agroforestry system, there is interaction among each and every component out of which the major interaction takes place between the trees and the agricultural crops. There are evidences of both positive and negative interactions.

Positive interactions include the following:

1. Litterfall from the trees helps in adding organic matter to the soil
2. Trees provides protection to the crops from adverse climatic factors like wind, dust storms, etc.
3. Edaphological roles like trees helps in preventing leaching of nutrients by spreading their roots deep into the soil
4. Reduce the chance of crop failure of the farmers acting as a substitute of the crops
5. Trees provide the need for fuel and firewood, fodder, food, etc.

Negative interactions include the following:

1. Competition among the trees and crops for space, light and moisture
2. Allelopathy which includes secretion of chemicals by the tree components

Other than these components there are pastures, rearing silkworms, lac culture, etc. However, in the recent year's sericulture has proved to be beneficial since the product obtained can fetch a high market value to the cultivator.

The need to promote integrated farming system

The main advantage of the integrated farming system is that if one component fails the other component acts as the source of income just like in agroforestry systems where if by chance there is a failure in crop yield the farmer can rely on the products from the tree component.

However, in other cases where there is obligatory coordination among the components there, the yield might get affected. For example, in case of poultry farming along with fisheries and aquaculture where the need of fishes and aquatic organisms are being met from the poultry component. But mostly, waste of each componentis not wasted and resources have been efficiently used in this system.

Conclusion

In combating the change in climate and other factors affecting the environment. The concept of integrated farming has been efficient in bringing sustainability in proper utilization of our resources which will consequently sustain the natural resources for longer term of use. The concept of this innovative method of farming has been spread by means of various agricultural extension programs and besides models on integrated farming throughout the country to create environmental awareness among the farmers and thereby maximizing their revenue and income in the rural level through the state level to the national level. Thus, adopting this system will not only help in increasing income of the farmer but will also improve the environment and manage the natural resources to be efficient in present as well as future use.

Agri-tourism : Sustaining Business for Farmers

Kiran[1], Amit Kanawjia[2], R.K. Kanojia[3] and Smriti Chaudhary[4]

India has a tradition of 'Atithi Devo Bhava' and its geographical and cultural diversity has always been a centre of attraction for tourists. There is immense potential in rural tourism in thousands of villages in India. The village here is full of greenery, adventure and local flavor. If agriculture and villages are linked with the tourism industry, then the face of the villagers can change. New sources of income for the farmers will be created and also its economy will be benefited. There is immense potential in agro-tourism in our country. Agro tourism is multifaceted and an emerging business option. In short, the people of the countryside in India have a lot to offer to the world. In such a situation, the possibilities of employment in agro tourism are increasing.

Introduction

Agriculture plays a prominent role in the livelihoods of more that 56% of the total working age population, promoting agriculture and agro-industry to improve food security and reduce poverty. The pilot project of Agro tourism by ATDC was made to start Under leadership of Pandurang Taware in 2005 in Malegaon near Baramati in Maharashtra, where the agro tourism was demonstrated on agriculture development trust's farm. Pilot project became a huge success with in two years.

Agro tourism is a practice of attracting tourists or visitors to an area used for agricultural purposes where visitors have something to see on the farms, have something to do on the farms and have something for visitors to buy. It includes a wide range of activities, including buying produce directly from a farm stand. It is a form of niche tourism that is experiencing growth in many parts of the world including India.Agri-tourism will be helpful in economic growth and enhancement of socio-cultural activities of rural areas and will be an excitement for family recreational activities.Agri-tourism can be hence defined as "The act of visiting a working farm or any agricultural, horticultural, or agribusiness operations for the purpose of enjoyment, education or active involvement in the activities of the farm or operation."By the countryside, dinner cooked and served by villagers, and a short performance with local musicians and peaceful environment aura of village life will add more fantasy.To live quiet free days from your busy life on a place where life seems to be easy and cool then this agri tourism is your best option for the same.

Market Growth opportunities

- Technavio Research has released a new market research report on the global agri-tourism market for the period 2019-2023.According to them Global Agri-tourism Market Will Grow at a CAGR of 18%.
- Agri-tourism market will register a 12.9% CAGR in terms of revenue, the global market size will reach US$ 10160 million by 2024, from US$ 5543.7 million in 2019.
- In India a untapped expected market of around 70 crores in the Indian region alone
- Indian travel and tourism sector's contribution to the GDP is expected to increase from $234.03 billion in 2017 to $492.21 billion in 2028.

Agri-tourism is an non metropolitan hospitality product, serving an agrarian lifestyle, abundant local cultural heritage with natural resources. In India, revenue from agri-tourism is growing at an annual growth rate of 20 per cent (Business Economics, 2019). So, agri-tourism has gained traction globally in the tourism industry. Agri-tourism is thought of as the crossroads of tourism and agriculture. Agri-tourism presents a unique opportunity to combine aspects of the tourism and agriculture industries to provide a number of financial, educational, and social benefits to tourists, producers, and communities (https://www.kyagr.com/marketing/agritourism.html). Furthermore, it also gives an opportunity to generate additional income and an avenue for direct marketing to consumers while providing educational opportunities to the public and helps to keep the family farm for the next generation.Agro-tourism gives people a hope to better understand the skill and hard work that go into producing abundance of food and fibre.

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Growth Rate Scenario of the Industry

Agri-tourism is a niche and an emerging market segment of the tourism industry. The agri-tourism market globally was valued at $42.46 billion in 2019 and is expected to reach $62.98 billion by 2027, registering a Compound Annual Growth Rate (CAGR) of 13.4% between 2020 and 2027.Currently, India's revenue from agro tourism is growing at an annual growth rate of 20%.

Significance of Agro tourism

Eco-Friendly Tourism: Rise in demand for natural and rural destinations as tourist attractions have brought eco-friendly tourismas a result of rapid climate change and pollution level induced by tourism and this is how agro tourism came into the mainstream business.

Addresses Rural 'Decline': India's agriculture has been under stress due to increased input costs, volatile returns, climatic adversaries, land fragmentation, and so on. Despite of the facilities, farmers have shifted to other industries in search of alternative livelihoods and income diversification.

Agro tourism can address the 'hollowing out' effect of rural decline and restore farmers' confidence in agriculture and ecosystem services.

Manifold Benefits to Farmers

Agro tourism helps in supporting incomes of farmers.It also acts as both a promoter and inhibitor to changing farmers' attitudes or preferences to farming. It incentivises farmers to use the land which would otherwise be left fallow or uncultivated.In contrast, it also prevents a portion of farmland available to a farmer engaged in agro tourism from cultivation, and instead uses it for tourism activities.

Benefits for Communities

Agro-tourism can be a vehicle for generating additional revenue for local businesses and services from tourists;upgrading / revitalising community facilities for residents and visitors;increasing protection of rural landscapes and natural environments for tourists and residents;helping preserve and revitalise local traditions, art, and craft:promoting inter regional, inter cultural communication and understanding.

Benefits for Tourism Operators

From a tourism industry view point, agro tourism can be a means of diversifying the mix of tourism products and services available to visitors; increasing tourism flows into attractive rural regions; increasing season length during traditionally off-peak business periods;uniquely positioning rural regions in key tourism markets;Bringing more non-local currency to local businesses.

Underlying Challenges

- If it becomes a more lucrative source of income, then active farmers may tend to ignore their farming activity and their attention and focus will shift towards agro tourism.
- The tourists prefer to visit agro-tourismcentres with a larger area and multiple fun and recreational activities.
- This will not solve the purpose of agro-tourism that is to support small and marginal farmers, who are unlikely to have larger agro-tourismcentres with several amenities.
- Linguistic challenges have been found to be one of the barriers in the enhancement of the tourism potential.
- People are found to be lacking proper fluency in Hindi, English or even local dialect, for interaction with the tourists.
- Insufficient financial support can hinder the tourism potential of the region, which would help the folks to preserve the local culture, traditions, heritage, art forms etc.
- The whole tourism concept is very indigenous in the rural areas. Though initiative attempts have been taken by the local youths, yet the professionalism is lacking.
- They are lacking proper training to project in a manner suitable from a tourism perspective.
- Some regions have great potential as an upcoming agro tourist spot. However, lack of business planning skills is another big obstruction in this path.

Promotion of Agro tourism

- **Policy Attention**: Agro tourism warrants greater policy attention in developing countrieswhere a

majority of the populace is either directly or indirectly dependent on agriculture.

- With perpetual adversities like uncertain cash flow, recurring debt trap and unpredictable climate, agro tourism can be promoted as an income-generating activity for farmers and strengthen economic, cultural and ecological resilience of rural regions.
- **Addressing Land Issues**: It is important for the government to address the issue of small/inadequate land to support agro tourism.
- One way to serve the tourist market is land consolidation through cluster-based farming or One District One Crop services.
- **Role of State Agencies/Investors**: The state agencies can account for farmers' economic dependence on farm operations and the perceived popularity of agro tourism activities in order to enable business environments for agri-ecosystem-based services.
- Social or impact investors can mobilise private equities into agro tourism based on the stage of the business and business model adopted by agri-preneurs.
- The ATDC can attract start-ups and impact investors to harness the business potential of the agro tourism landscape in India.
- **R & D for Agro tourism:** Promotion of Agro Tourism needs conceptual convergence with Rural Tourism, Eco Tourism, Health Tourism, Adventure Tourism and culinary adventures.
- Research is one of the key factors for development in any discipline as it helps students and practitioners to get involved in their areas of interest and search for all possible solutions for the benefit of local communities.

Farmers can promote agro tourism by:

- Give a wide publicity of their tourism centre by newspapers, television etc. and develop contacts with the schools, colleges, NGOs, clubs, unions, organisations etc.
- Train their staff or family members for reception and hospitality of the agri-tourists.
- Understand the customers' demands and their expectations and serve them accordingly.
- Charge optimum rent and charges for the facilities/ services on the commercial base.
- Develop a website and update from time to time to attract foreign tourists and take their feedback and comments about the service and suggestions for more development and modification.
- Develop different agri-tour packages for different types of tourist and their expectations.
- Small farmers can develop their agro tourism centres on the basis of cooperative society.

Conclusion

Agro tourism is a very good opportunityto sell agri produce and provides good supplementary income and employment to localities. It also maintains cleanliness and hygiene of farmer'sfamily. Farmer gets social respect in the society, environment and cultural conservations and enhancement is promoted. Agro tourism is the best way of empowering farmers by giving them sustainable income, sustainable employment and sustainable livelihood.

Integrated Farming System and its importance in the current scenario

Khaidem Jackson[1], Thounaojam Thomas Meetei[1] and YumnamBijilaxmi Devi[2]

The uncertainty of income and employment to the farmers in the present agriculture crop production forcedto evolve suitable strategy for augmenting the income of a farm. Integration of different agricultural enterprises improves the overall production that supplements the farmer income as well as increased the employment. Integrated Farming System (IFS) is a holistic approach to agriculture which is based on the concept that a farmer can incorporate traditional systems with other adaptable farming methods like livestock, fishery and allied arrangements in a single farm. With the installation of Integrated Farming Systems, farmers will be able to enjoy certain benefits both socially and economically. It promotes economic safety, food and livelihood security, protection of the environment which is fundamental for the survival of all the farmers and man alike. An IFS is one such system and we can still yearn for more.

Introduction

Integrated Farming System (IFS) is a holistic approach to agriculture which is based on the concept that a farmer can incorporate traditional systems with other adaptable farming methods like livestock, fishery and allied arrangements in a single farm. In the current scenario of India, the livelihood of almost 60% of the total population depends on agriculture and agro-related activities. Most of the farmers have small land holdings of 0.81 ha in average and are considered to be marginal farmers. These farmers majorly concentrate on cereal based crop production and carry risks of climatic anomaly like uncertainty in monsoon, floods, droughts etc. Intensification in agricultural practices, also have not been able to curb its unreliability in income and employment generation, achieving food and environmental security at farm level. Typically speaking, mono-cropping system cannot sustain the livelihood of these farmers.

To minimize the problems of this input centred agriculture system, the integration of crops along with livestock, fishery etc. can sustain food security and a regular/periodic source of income for the marginal farmers. Implementing IFS can promote higher income due to its various sources, minimize the risks involved with crop failure and can regulate the available resources efficiently as possible to generate a sustainable environment friendly farming system. While also maximizing the utilization of land, it encourages integrated farming of crops, forestry and livestock within the stipulated land simultaneously.

Importance of IFS

Integration is a term used to define the combination of two or more things such that one becomes a natural part of the other. The production system in IFS is interdependent, interrelated and interlocked together. The crops produced, livestock and other subsidiary bodies work together to maximize the utilization of nutrients in each system as well as minimize the negative effect of the system on the environment. The primary and secondary produce of a system aremutually integrated to form a single whole unit. For example, the produce from farm can be utilized for the livestock; the waste from livestock can be recycled in the farm itself for nutrients in the next crop. Such an arrangement can provide an economically sustainable and environmentally viableresult in a single farming unit.

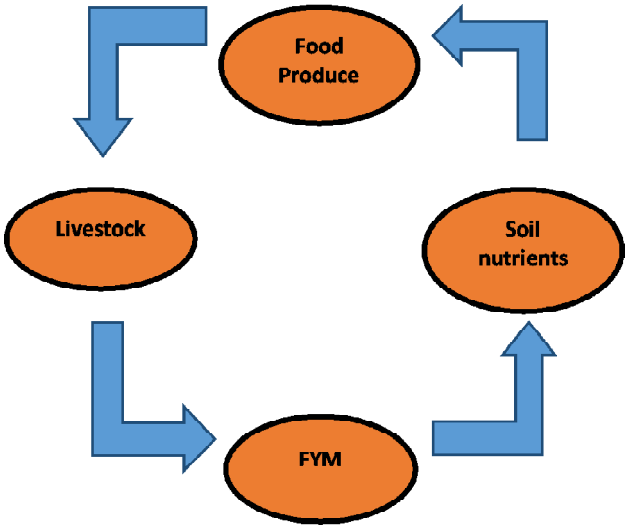

Fig: Sample Integrated Farming System unit

In India, efforts have been made to promote a low cost farming system for the marginal farmers whereby farm wastes and other availableresources are optimally utilized in Indian conditions. The package of practices have been developed for integrated fish cum pig,

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integrated fish cum duck and integrated fish cum poultry farming; which has been extensively verified for economic feasibility for the rural farmers.

Advantages of IFS

With the installation of Integrated Farming Systems, farmers will be able to enjoy certain benefits both socially and economically. Some benefits can be discussed as under:

i. IFS are more advantageous for farmers as produce can be made with optimal resource utilization, recycling waste materials and employing family labour.

ii. The profitability of integrating livestock into crop based farming will increase financial resources and better use of farm products such as manure, crop residues, etc.

iii. Minimizing the risk of crop failure in a farming unit due to diseases, droughts, etc.

iv. Crop residues can be used to feed animals while enhancing agricultural productivity can be done through utilization of manure from livestock; which minimizes the use of chemical fertilizers.

v. Production of Biogas is possible with the animal waste and it is a clean/sustainable energy source.

Conclusion

Integrated Farming System provides an efficient management practice for the available farm resources along with generation of adequate income for the marginal farmers. It promotes economic safety, food and livelihood security, protection of the environment which is fundamental for the survival of all the farmers and man alike. Apart from all this, a synergistic approach to agriculture can yet be achieved where resource use efficiency is high and the farm by-products can be properly managed. IFS are one such system and we can still yearn for more.

Integrated Farming system model for the hilly tribal areas of Manipur

Sanjenbam Dayananda Singh

Agriculture is the mainstay of livelihood for the tribal people inhabited in the hilly districts of Manipur. The hilly area occupies almost 90% and the valley, with just 10% land of the total state areas. The farmers in this region are practicing subsistence farming for their livelihood as shifting cultivation. Shifting cultivation contributed to low productivity, required intensive labour, soil erosion, deforestation and destabilisation of the ecology. It is required for an alternative way of production system which involved crops, livestock, fisheries, fruits, trees etc. by harnessing available resources without harming the ecosystem. Integrated Farming System is an interdependent, interrelated often interlocking production systems based on crops, animals and related subsidiary enterprise in such a way that maximize the utilization of nutrients of each system and minimize the negative effect of these enterprises on environment.

Introduction

Manipur is entirely rainfed and rice occupies more than 80% of the agricultural area in the kharif season. The landholdings are small and the farmers practice subsistence farming for their livelihood. The size of the cultivated area is about 7.41% of the total geographical area of the Manipur. The agricultural operations are carried out up at an elevation of 3000 m above MSL on slopes up to 60% gradient. Problems of high rainfall (12.1 % of country's total precipitation), soil acidity, aluminium toxicity in upland and iron toxicity in valley land have added to the problem of low agricultural productivity in the region. The soils of the region are usually rich in organic matter and acidic to strongly acidic (pH 4.5- 5.0) in reaction. Most of the hill soils are shallow in depth except in valleys and plateaus.

The hilly area occupies almost 90% and the valley, with just 10% land of the total state areas. They largely practise shifting cultivation as the permanent terrace cultivation is limited in the foothills. Shifting cultivation is a labour-intensive mode of agricultural activity. It has a traditional characteristic concerning traditional agriculture where land and labour are highly complementary to each other. Productivity is low, multi-cropping method is adopted and use of human labour is the main input and labour is reciprocal in nature under the system. Shifting cultivation contributed to soil erosion, deforestation and destabilisation of the ecology. However, under it the use of chemical fertilisers and pesticides is insignificant. Directorate of Economics and Statistics (2014) data on fertiliser usage in the hills of Manipur show an insignificant amount, implying organic agricultural production under shifting cultivation.

The peoples of the state are meat lovers and a huge demand exists for poultry, pork and other meat products. Invariably, there exist deficit in crops, livestock and fishery products. With this backdrop, it is necessary for an alternative way of production system which implies for crops, livestock, fisheries, fruits, trees etc. by harnessing available resources without harming the ecosystem.

Integrated Farming system

Farming system approach requires involvement of agriculture, horticulture, soil conservation, forestry, fisheries, animal husbandry (piggery and poultry), apiculture, etc. Integrated farming system takes into account the concepts of minimizing risk, increasing production and profits whilst improving the utilization of organic wastes and crop residues. Literal meaning of integrate is to combine two things in such a way that one becomes fully a part of the other. Integrated Farming System (IFS) is an interdependent, interrelated often interlocking production systems based on few crops, animals and related subsidiary enterprises in such a way that maximize the utilization of nutrients of each system and minimize the negative effect of these enterprises on environment. The interrelated, inter-dependent-interlocking nature of IFS involves the utilization of primary produce and secondary produce of one system, as basic input of the other system, thus making them mutually integrated as one whole unit. Primary goals of IFS are

- Maximization of yield of all component enterprises to provide steady and stable income at higher levels.
- Rejuvenation/amelioration of systems productivity and achieve agro ecological equilibrium.
- Control the built-up of insects-pest, diseases and weeds population through natural cropping system management and keep them at low level of intensity.

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- Reducing the use of chemical fertilizer and other harmful agrochemicals and pesticides to provide pollution free, healthy produce and environment to the society at large.
- Increase in natural resource use efficiency by early recycling of nutrients.
- Mitigation of negative impact of agriculture or livestock on environment.

IFS models for the tribal areas of Manipur

Considering the physical, social and economic limitations of the Manipur, an integrated farming system model was developed by ICAR Research Complex for NEH Region, Manipur Centre, Imphal. The model comprises 4 ha of fenced area in the vicinity of the tribal settlement integrated with several components.

i. Cereals (paddy and maize)

ii. Legumes (groundnut and pea)

iii. Vegetables (cabbage and cauliflower)

iv. Fruits (tree bean, kachai lemon and orange),

v. Livestock (6 piglets, 125 poultry)

vi. Fishery (fingerlings of Common carp, grass carp and Catla)

For harvesting of rain water, Jalkunds was constructed using agri-polythene sheets of 250 micron. Vermicomposting unit for waste recycling was also developed.

From this Integrated farming system model, the farmer can harvest 4.80 t/ha of paddy as compared to 3.25 t/ha under traditional practices. Maize cultivar Pusa composite-3 produced 3.25 t/ha as compared to local maize cultivar yield 1.70 t/ha and the groundnut (ICGS-76) which gave 2.40 t/ha dry pod yield. The vegetable yield considerably increased in this model which gave 1.50 lakh net returns from cabbage and cauliflower. In the 2nd year, the number of piglets increased to 15 including with six pigs. In poultry farming, the chicken breed Gramapriya is performing well and farmers were getting 40-45 eggs/day. There was adoption of composite fish production in which grass carp was surviving on middle and upper layers of water and common carp in lower layers of water. The Jalkund structures can stored water upto 30,000.00. In improved practice, from four ha land, the total net returns Rs 3,63,500/ [(Paddy cultivation (2 ha)= Rs 82000, Groundnut production (0.5 ha)= Rs. 38000, Maize production as green cob (0.5 ha)= Rs. 23000, Vegetable production in rabi season (1 ha, Cabbage and Radish)=Rs. 150000, Fruit production (Fruiting not started)=Nil, Piggery= Rs. 37000, Poultry= Rs. 16000, Fishery= Rs. 17500] as compared to 105000 in normal mono cropped. This model made a positive impact on the utilization of scarce resources under fragile hilly ecosystem benefitting tribal farmers at large.

A scientifically sound and economically viable production system under integrated farming systems suitable particularly for hilly regions of the North Eastern Region are

- Integrated Fish cum Pig farming
- Integrated Fish cum Duck Farming
- Integrated Fish Farming-Chicken
- Integrated Fish farming-cum-Cattle farming
- Integrated Fish farming-cum-Rabbit farming
- Integrated Fish farming-cum-Agriculture

Conclusion

There are always integrations at different levels in the existing family farming system practiced by the small holding farmers in the region. Inculcation of scientific approach like integrated precision farming in management of different components will not only improve resource use efficiency in existing production system but will also help to climb up a step towards sustainability of small holder family farming production system in future by mitigating its negative on environment through proper recycling of nutrients.

Floricultural Intervention: Promoting Agro tourism for a Healthy Lifestyle

Aayushi Yadav[1], Rakesh Kashav[2], Amit Kanawjia[3] and Ruby Pandey[4]

Agro-tourism, a unique blend of agriculture and tourism, has gained popularity as a means to reconnect with nature and promote a healthy lifestyle. Floricultural interventions in agro-tourism destinations play a significant role in enhancing visitor experiences and fostering well-being. This article explores the impact of floriculture on agro-tourism and its benefits in promoting a healthy lifestyle. By incorporating flower gardens, workshops, and educational opportunities, visitors can immerse themselves in the beauty of flowers, experience mental and physical rejuvenation, and gain insights into sustainable farming practices. Floricultural interventions in agro-tourism destinations contribute to environmental conservation and provide physical activity and wellness opportunities. As the demand for meaningful travel experiences grows, combining floriculture and agro-tourism offers a pathway to a healthier and more fulfilling lifestyle.

Introduction

Agro-tourism is a concept that combines agriculture and tourism. It has gained significant popularity in recent years. It offers people a chance to escape the hustle and bustle of urban life and reconnect with nature and the agricultural landscape. While traditional agrotourism focuses on showcasing farming practices and rural life. There is a growing trend towards incorporating floricultural intervention to enhance the experience and promote a healthy lifestyle.

Floriculture, the cultivation of flowers and ornamental plants, has been appreciated for its beauty and aesthetic appeal. However, its potential goes beyond mere visual delight. Integrating floriculture into agro-tourism ventures adds a new dimension, providing visitors with a multi-sensory experience that stimulates the mind, body, and soul.

The world tourism organization has estimated that the tourism industry is growing at a rate of 4 per cent annually. The Indian tourism industry is growing at 10.1 per cent, 2.5 times more than the world rate. Maharashtra is the pioneer state to develop and promote Agro tourism in the country. Agro Tourism Development Corporation was incorporated in 2005 and owns the pilot Agro tourism project of 28 acres in Palshiwadi, Tal district Pune.

This article explores the significance of floriculture in promoting agro-tourism for a healthy lifestyle and highlights its numerous benefits.

Floricultural Interventions as an Asset for Agrotourism

- **For mental well-being**

One of the primary benefits of floricultural intervention in agro-tourism is its positive impact on mental well-being. Numerous studies have shown that exposure to natural environments, such as flower gardens, calms the mind, reducing stress and anxiety. The vibrant colours, fragrant scents, and overall serenity of floral landscapes create a tranquil ambience that promotes relaxation and rejuvenation. Visitors can immerse themselves in the beauty of nature, away from the pressures of daily life, and find solace in the therapeutic atmosphere of flower-filled gardens.

- **For physical well-being**

In addition to mental health benefits, floricultural intervention in agro-tourism promotes physical well-being. Activities such as flower picking, garden walks, and hands-on workshops provide exercise and encourage a healthy lifestyle. Visitors can enjoy a stroll through flower beds, participating in gentle physical activity that promotes cardiovascular health and improves overall fitness. Some agro-tourism establishments even offer yoga or meditation sessions amidst flower gardens, enabling visitors to combine physical movement with mindfulness for a holistic wellness experience. This way, Agro tourism becomes a gateway to incorporating regular physical activity into daily routines, encouraging visitors to embrace a more active and balanced lifestyle.

- **Educational and cultural value**

Furthermore, floricultural intervention in agro-tourism can have educational and cultural value. Flower gardens often feature a diverse range of plant species, including both native and exotic varieties. Visitors can learn about different flowers, their origins, growth

patterns, and unique characteristics. Interactive workshops and demonstrations on flower cultivation and arrangement provide valuable knowledge and skills that can be applied in everyday life. This educational aspect enhances visitors' understanding of the natural world and fosters an appreciation for horticulture, biodiversity, and sustainable practices.

- **Economic stability**

The floricultural intervention also contributes to the economic sustainability of agro-tourism. Incorporating flower gardens into agricultural landscapes diversifies revenue streams for farmers and agro-tourism operators. Flowers can be harvested and sold as cut flowers or used in value-added products such as essential oils, natural cosmetics, or herbal teas. Additionally, floral-themed events and festivals attract visitors, boosting local tourism and generating income for the community. Agro-tourism ventures that embrace floriculture create opportunities for employment, entrepreneurship, and economic growth, promoting overall sustainable development.

- **Promoting Sustainable Agriculture and Environmental Conservation**

Floricultural interventions in agro-tourism destinations can contribute to sustainable agriculture and environmental conservation efforts. By promoting organic farming practices and the use of eco-friendly fertilizers and pesticides, flower gardens demonstrate the importance of protecting the environment and preserving biodiversity. Additionally, agro-tourism destinations can raise awareness about the significance of pollinators, such as bees and butterflies, in flower cultivation. Visitors can witness the intricate relationship between flowers, pollinators, and the ecosystem, inspiring them to support conservation initiatives.

Some Agri tourism spots in India

Although the Agro tourism industry is still in its initial phases in India, it has shown immense potential wherever used. Some great examples of the same in our country are:

a. DewalokamFarmstay Retreat, Karimannoor, Kerala

b. Vanilla County, Kottayam, Kerala

c. Konyak Tea Retreat, Mon District, Nagaland

d. Maachli, Sindhudurg, Nagaland

e. Enchanted Forest Farm, Gangtok, Sikkim

f. Prakriti Farms, Rupnagar,Punjab

What to do?

Collaboration between farmers, tourism operators, and local authorities is crucial to maximize the potential of floricultural intervention in agro-tourism. Farmers can receive training and support in flower cultivation techniques, while tourism operators can develop attractive floral landscapes and engaging activities. Government agencies can provide incentives, funding, and policy frameworks to encourage the integration of floriculture into agro-tourism initiatives. By working together, these stakeholders can create a flourishing ecosystem that benefits the agricultural sector, the tourism industry, and visitors' well-being.

Some other tools of floriculture that can be used to add to increase the potential of Agro tourism are:

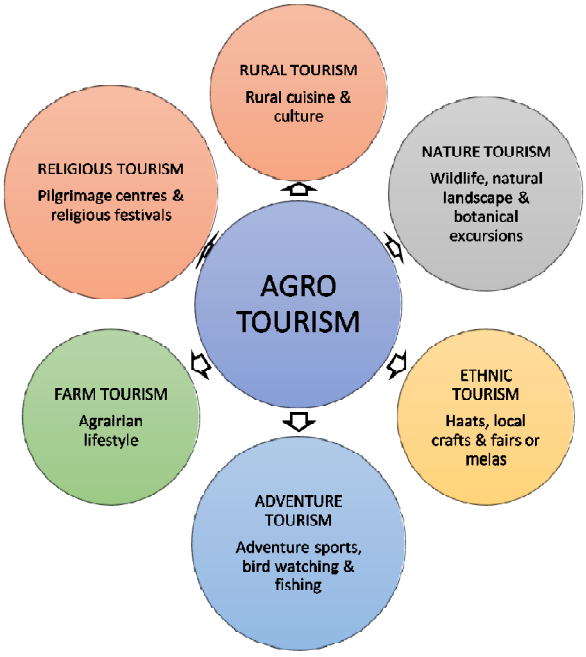
a) Ecotourism

b) Photography and social media

c) Farm stays and accommodations

d) Experimental activities

e) Giving visual appeal to the place



Types of agro tourism practices

Conclusion

In conclusion, floricultural intervention in agro-tourism offers a unique and enriching experience that promotes a healthy lifestyle. It combines the beauty of flowers with the tranquillity of natural environments, fostering mental well-being and relaxation. The physical activities associated with flower gardens contribute to improved fitness levels, while educational opportunities enhance visitor's knowledge and appreciation of horticulture. Agro tourism destinations that embrace floriculture empower individuals to reconnect with nature, learn about the importance of environmental conservation, and cultivate a deeper appreciation for the natural world. Additionally, floriculture in agro tourism can drive economic sustainability and local development. Hence, the promotion of agro tourism is of great importance to generate more opportunities in the field of floriculture.As more people seek meaningful travel experiences, the combination of floricultural interventions and agro tourism holds immense potential in fostering healthier, happier lives.

Agroforestry landscapes as eco-tourism destinations for youngstersto comprehendtheir responsibilities towards Mother Nature

Hirdayesh Anuragi, Suresh Ramanan, Asha Ram, Naresh Kumar, A. K. Handa, A. Arunachalam

Agroforestry is simply an interaction of agriculture and perennial trees for effective land-use management. This is the best possible way of extracting several tangible and non-tangible benefits while also considering our environmental sustainability and climate change mitigation which have become a major global threat in the 21st century. An improved habit of awareness and care towards nature has to be inculcated among modern day's youth for its sustainability. Beautifully developed agroforestry-based landscapes offer a venue for attracting local inhabitants and tourists for several nature-based recreational activities which not only enable them to perceive nature and its components as essential but also make them involved in rehabilitation of the degraded ecosystems. Carbon and ecological footprints are the important measures of climate change mitigation which can be taken care off through agroforestry-based eco-tourism.

Introduction

An exposure to the local culture and the ecosystem is essential for long term sustainability of a region and its inhabitants. Through various means the people have to be engaged in the activities to maintain their affection and responsibilities towards our mother nature. Thus, nature-based tourism has become a current global trend that have attracted different types of visitors particularly dwellers from non-rural or urban concretes who rarely experience nature-based recreational activities of typical rural backgrounds. This offers a great and innovative opportunity for visitors to interact with farm and forest life and learn through recreation the nature and its importance in their lives.Agro-tourism takes visitors to farms and ranches to educate them about the local culture and boost revenue, while ecotourism encourages responsible and sustainable travel to locations with the goal of conserving and maintaining the environment.Agro-tourism has gained popularity recently among people who never had the chance to rediscover their rural roots. This has developed into a large scale market for tourists leading to a good revenue generation. Similarly, agroforestry-based eco-tourism is a new emerging trend to explore and understand the nature of perennial tree species, their ecology and importance along with joyful of nature-based recreational activities of visitors. Agroforestry is basically known for its effective way of land-use management which combines agriculture and perennial trees for enhancing the overall productivity and sustainability. This also integrateslivestock for effective management of the resources and enhanced productivity of a system. Agroforestry involves several combinations like agri-silvicultural systems (crops and trees including shrubs/ vines and trees), silvo-pastoral System (trees + pasture and/or animals), agro-silvo-pastoral system (trees + crops+pasture/animals) and others like apiculture with trees, aqua-forestry and multipurpose wood lots, etc., which provide both productive and protective functions.

Agroforestry is an essential field in today's era of climate change that provides several economic, social and environmental benefits while reducing a pressure on forest cover. A healthy ecology is very much crucial for overall wellbeing and prosperity of mankind and the nature.Agroforestry increases the carbon sequestration, and support soil health and improves the biodiversity through various means.The increasing human population and development activities have exerted a huge pressure on climate change that led to the global warming and associated ill effects particularly in the 21st Century. Also, the degraded landscapes and ecosystems have badly impacted on the lifestyle of local inhabitants including animals, birds and microorganisms which are highly essential for a healthy nature. Another unavoidable consequences of humankind activity in this century includesdigital, carbon and ecological footprints.Modern's days people particularly the city-dwellers have moved so fast that they left their own mother nature far behind. Therefore, an enhanced awareness and a large scale effort towards our ecosystem is extremely important for its restoration and sustainability for the future generations.

Agroforestry-based ecotourism provides an umbrella people have a practical exposure through visitsand gain their responsibility towards nature while also generating a revenue for the owner. This kind of responsible travel to natural landscapes that protects the

ICAR-Central Agroforestry Research Institute, Jhansi

ecosystem and sustains the well-being of the local inhabitants, provides a very good venue for learning about the nature and our role in maintaining the green cover.Perfect agroforestry farms or a landscapes encourage its tourists to know more about the agriculture, forestry, horticulture, animal husbandry, fisheries, apiary, and any more aspects of cultivation besides improving the health of the nature on a much deeper level than the travelers just passing through.This adds a lot of practical experience by staying at farm itself for overnightand live a natural life by experiencing the available resources. Tourists involve themselves in various farming activities like sowing, planting, irrigation, harvesting, and other management practices and gain knowledge on various natural phenomenon occur in the field. For instance, a person from city who never experienced harvesting a fresh apple or walnut, would certainly be more excited if he gets any opportunity to stay at a farm and enjoy the experience by himself. This also generates an additional revenue to the farm owner. In addition,touristsalso gain a deeper understandingof various challenges faced by the farmers while growing the food that fulfills the demand of the mankind or a society. A hands-on experience of various aspects of cultivating a tree species for wood, fruits, fodder, fuel, etc., requirements would certainly improves the interests and knowledge towards nature.Further, the farm recreational activities may include outdoor recreation like educational experiences,entertainment (harvest festivals), hospitality services (farm stays, guided tours or outfitter services) and even on-farm direct sales of fresh produce.

Figure: Exposure visits of city-based youngsters to agroforestry landscapes

Agroforestry-ecotourism thus act as a responsible tourism which aims to minimize any negative impacts on the environment and cultural heritage besides doing regular agriculture.This type of tourism has been growing in popularity over the past few years, as it has many benefits for both tourists and local communities. Agroforestry-based ecotourism can have a positive impact on local economy. As tourism becomes more diversified, businesses that are directly related to tourism – such as transportation, lodging, food, and attractions – become more prosperous.It helps protect natural resources. When tourists visit natural areas and ecosystems, they are more likely to conserve these resources because they understand the importance of them.It promotes social and environmental awareness. Through ecotourism, people can learn about the importance of conservation and find ways to help protect the environment.It builds relationships between people and nature.This not only satisfy the visitors by enjoying the nature but also generate a supplemental income for the owner. In India, adedicated premier institute viz., ICAR-Central Agroforestry Research Institute (CAFRI) located at Jhansi may act as a beautiful venue for agroforestry-based eco-tourism where people can stay and explore various agroforestry systems and understand their importance in meeting the economic, social and environmental demands in the era of climate change.

Conclusion

Agroforestry-based eco-tourism is a newdimension which provides a unique opportunity of enhancing knowledge and responsibilities towards combination of agriculture and forestry along with other enterprises for economic, social and environmental benefits. City-based dwellers and other less exposed youngsters through ecotourism visit to a well-established agroforestry systems or landscapes would have a joyful experience of hands-on approach of getting educated about some of the facts regarding importance of agriculture, trees and associated ecosystems for mitigating the adverse effects of climate change and sustaining the Mother Nature for a healthy and safe future.

Village tourism/Rural tourism: Way for sustainable development

[1]Channakeshava C and [2]Pavithra B S

Promoting the socio-economic growth of different parts of the world, tourism sector also promotes international peace. It offers a chance to discover new cultures and to expand one's view of the world. It also helps to conserve the tourist destinations' cultural heritageand natural wonders and supports the locals with a means of livelihood.Agro-tourism is to develop a unique product for integrated tourism that will contribute to the sustainable development of rural areas. Rural tourism showcases the rural life, art, culture, and heritage at rurallocations, thereby benefiting the local community economically and socially as wellas enabling interaction between the tourists and the locals for a more enrichingtourism experience.

Introduction

India is a global agricultural powerhouse and most important sector for economy. Indian agriculture sector accounts for 18 per cent of gross domestic product (GDP) and provides employment to 50 per cent of the countries workforce. Providing additional income generating activities to existing agriculture would certainly increase contribution of agriculture to national GDP. Agri tourism will serve this purpose.

Agri tourism is the latest concept in the Indian tourism industry. It gives an opportunity to experience the real enchanting and authentic contact with real life. Promotion of Agri tourism needs conceptual convergence with rural tourism, health tourism and adventure tourism. In this article, authors are highlighting the importance of village/rural tourism. Since a large part of the country is rural and depends on agriculture and allied activities for their livelihood and income. Developing rural economy andcreating jobs and opportunities in rural areas is therefore essential forsustaining rural life.

Any form of tourism that showcases the rural life, art, culture, and heritage at rurallocations, thereby benefiting the local community economically and socially as wellas enabling interaction between the tourists and the locals for a more enrichingtourism experience can be termed as rural tourism.A variety of terms are employed to describe tourism activity in rural areas: agritourism, farm tourism, rural tourism, soft tourism, alternative tourism, eco-tourism, and several others, which have a different meaning from one country to another.

Rural tourism focuses on the visitor actively participating in a rural lifestyle. Thetourist travels to a rural location and experiences the life while taking part in thedaily activities of the village. The tourist also gets a chance to imbibe the traditionsand culture of the area. Rural tourism may also include overnight stay in which thevisitor also gets to know the unique lifestyle of the village at much closer quarters.Rural tourism is multi-faceted and entails agricultural tourism, cultural tourism,nature tourism, adventure and ecotourism, which are all closely aligned.

There is an increasing trend of '*experiential tourism*' to know new things and experiencing cultures, cuisine, traditions, etc. Today, the discerning traveler isprepared to go great distances and to previously unknown places to get the uniqueexperience. The tourist is also looking at being a responsible traveler and aboutgiving back to the host communities.The slow pace of life in the village, far away from the hustle and bustle of the bigcity, is an experience that can rejuvenate oneself. The villages and the ruraleconomies also have practitioners of unique arts and crafts in their original formsthat are hard to come by in the cities.

Rural tourism exhibiting the uniqueexperiences of Indian villages and closely related niche areas of tourism such as ecotourism, farm-tourism, adventure tourism etc. provides a great opportunity topromote sustainable and responsible tourism in the country.Rural Tourism can revitalize local art and crafts and prevent viable traditionaloccupations from being displaced. It will help redevelop rural areas and rejuvenaterural life. The interaction with the visitors will expand their knowledge and horizons.

Characteristics of rural tourism

The concept of rural tourism has a noble cause. It is another kind of sustainable tourism that exploits resources in rural regions, causes little or no harmful

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impact, and generates increasing benefits to rural areas in term of rural productivity, employment, improved distribution of wealth, conservation of the rural environment and culture, local people's involvement, and a suitable way of adapting traditional beliefs and values to modern time.Some characteristics features of rural tourism are following as:

- Seasonality
- Fragmentation
- External market needed
- Co-operation needed between internal and external market
- Role of women
- Economic role: side income for farmers and other entrepreneurs in the rural area.

Rural tourism could help in boosting the local performing arts and help conserve the local culture and can prevent rural migration. Rural tourism could attract the tourists by providing an excellent glimpse of the village ambiance with local cuisine.

Rural tourism development

Rural tourism development is more than just a planned process. Using an actor-oriented approach, it can be seen as a dynamic, on-going socially constructed and negotiated process that involves many social actors who continuously reshape and transform it to fit it to their perceptions, needs, values, and agendas.

Ministry of tourism is responsible for promotion of tourism in the country.The ministry implements various schemes for creation of infrastructure,marketing and promotion and skill development initiatives for tourism, whichcan be leveraged for promotion and development of rural tourism. TheMinistry will coordinate and spearhead the strategy at the national level.The ministry of rural development is working towards sustainable andinclusive growth of rural India through a multipronged strategy foreradication of poverty by increasing livelihoods opportunities, providingsocial safety net and developing infrastructure for growth.

Rural tourism in India has the following strengths, weaknesses, opportunities and threats

- Indian villages have unparalleled culture, craft, music, dance and heritage to offer to the visitors.
- Expansion of road infrastructure has made most of the rural areas accessible.
- Well-developed agriculture and farms to provide stay facilities and experiences.
- Beautiful climate conditions and Bio-diversity.
- Apart from the mainland rural areas, India has coastal, Himalayan, desert, forest and tribal areas amongst others for tourists.
- India has huge potential for related areas such as Eco-tourism, Nature Reserves and wildlife tourism.

Weaknesses

- Lack of prioritization for rural tourism at the state and national level
- Poor profiling of rural product offerings
- Poor tourism supporting infrastructure including ICT in rural areas
- Lack of tourism awareness and skills in rural areas,
- Poor resource allocation and lack of inclusive planning and community involvement,
- Poor coordination of tourism initiatives,
- Capacity gap at the Panchayat Raj institutions to promote rural tourism
- Poor service delivery and lack of implementation

Opportunities

- Creation of jobs, retention of jobs and new business opportunities
- Rural tourism can lead the way for sustainable and responsible tourism
- Sustainable exploitation of untapped rural culture and heritage offerings
- Indigenous knowledge systems,
- Promoting Agri-tourism,
- Promoting Eco-tourism Promoting Adventure-tourism,
- Promoting Leisure tourism,
- Promoting Marine tourism,
- Volunteer tourism,
- Rural Tourism Circuits

Threats

- Lack of reliable data and statistics
- Lack of well-planned approach,
- Environmental degradation
- Social and cultural influences

Need for rural tourism for the sustainability of tourism

Infrastructure limitation is a common problem in rural India that can be solved by promotingRural Tourism as it creates favorable condition for basic infrastructure development. It has asignificant economic contribution as different tourism associated activities actually generate cashinflow that benefits rural community. Varieties of earning scopes provide better possible ways tomaintain daily day living. Rural producers, marketers, suppliers all get benefit from suchalternative tourism. 'Fundamental for a sustainable tourism industryis accepting the key principles underlying the concept of rural tourism'. Promotion andresponsible marketing approaches help the host community and local entrepreneurs to recognizethe intrinsic value of rural tourism. Ethical responsibility motivates both the host and the touriststo behave sensibly towards the environment. Such behavior prevents the exploitation of tourismresources and as a result, all get long-term benefit as the principal and primary product of ruraltourism is always rural culture and heritages along with nature and its rich bio-diversity. Inaddition, from direct participation tourists get real time experience and opportunity to minglewith the hosts' culture and it helps to build up harmony and fraternity in between tourists andlocal community.

Scope for rural tourism in Indian context

In 2002 National Tourism Policy, Rural Tourism was recognized as a focus area for employment generation and sustainable livelihoods. In that policy it was clearly being said that, "Specialthrust should be imparted to rural tourism and tourism in small settlements, where sizable assetsof our culture and natural wealth exist." But in a country like India, where almost 70 per cent of thetotal population stay in rural areas and a good percentage of rest of the number have their ownorigins in different rural Indian villages and even after they are staying in urban areas, they havea habit to go back to their village homes on different occasion throughout the year, the idea ofrural tourism is a kind of puzzle for the Indians as it is obvious to raise one important question*i.e.* "why should Indians pay good money to go to some other villages?" in recenttime the tourists' attitude has been changed a lot and it is true both for the domestic and foreigntourists. The tourists are now looking for such a trip that can offer them meaningful experienceand quality environment. These better-educated travelers are very much interested in differentoutdoor amusement and recreational activities. Moreover, the concern for nature anditssustainability is growing day by day. In this connection, the interest for alternative tourism suchas eco-tourism, special interest tourism, heritage tourism etc., is also increasing and such changeof preference is driving these tourists to go to rural areas where fragmented nature and rich biodiversity can easily satisfy their ultimate desire i.e. to experience and to enjoy the rustic charmsof rural India in the lap of the nature. Apart from that, meaningful holiday and fulfillment ofexpectation at a reasonable price also increase the chance of repeated visits by the backpackers.

Need for rural tourism for the sustainability of tourism

Infrastructure limitation is a common problem in Rural India that can be solved by promoting Rural Tourism as it creates favorable condition for basic infrastructure development. It has a significant economic contribution as different tourism associated activities actually generate cash inflow that benefits rural community. Varieties of earning scopes provide better possible ways to maintain daily day living. Rural producers, marketers, suppliers all get benefit from such alternative tourism. According toPavel (2013), 'Fundamental for a sustainable tourism industry is accepting the key principles underlying the concept of rural tourism'. Promotion andresponsible marketing approaches help the host community and local entrepreneurs to recognize the intrinsic value of rural tourism. Ethical responsibility motivates both the host and the tourists to behave sensibly towards the environment. Such behavior prevents the exploitation of tourism resources and as a result, all get long-term benefit as the principal and primary product of rural tourism is always rural culture and heritages along with nature and its rich bio-diversity. In addition, from direct participation tourists get real time experience and opportunity to mingle with the hosts' culture and it helps to build up harmony and fraternity in between tourists andlocal community.

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Conclusion

The goal of agro-tourism is to develop a unique product for integrated tourism that will contribute to the sustainable development of rural areas. Sustainable development of rural locations, on the other hand, can be interpreted as an optimization of the development parameters with regard to growth constraints, objectively specified by the system's internal characteristics and external forces. Rural tourism can revitalize local art and crafts and prevent viable traditional occupations from being displaced. It will help redevelop rural areas and rejuvenate rural life.

Integrated Farming Systems fora Sustainable and Thriving Ecosystem

PrashantYadav[1],AnuragMishra[2],RajatChaudhary[2] andDeeptiSrivastava[3]

An integrated farming system (IFS) is a holistic approach to farming that combinesvarious components such as crops, livestock, poultry, fishery, forestry, and agro-industries ina sustainable manner to achieve maximum productivity and profitability. The need for anintegrated farming system is driven by several factors, including declining soil health, climatechange,waterscarcity,greenhouseemission,incomediversification,andsustainableagriculture. The integrated farming system promotes sustainability by optimizing resourceutilization. By practicing integrated farming system, farmers can create a closed-loop system where waste from one component becomes avaluable input for another. The various components of integrated farming system and their benefits areas follows.

Introduction

Soil health is acritical factor that significantly impacts the productivity, resilience, and sustainability of agricultural systems. As the foundation of all plant growth, soil provides essential nutrients, water, and ahospitable environment for beneficial soil organisms. Recognizing the importance of soil health is crucial for sustainable agricultural practices and ensuring food security in the face of global challenges such as climate change and population growth. But, due to continuous monoculture and intensive use of chemical fertilizers and pesticides, the soil heal this degraded. That lead store duced fertility, soilerosion, and increased susceptibility to various biotic and abiotic stresses. An integrated farming system that combines crop and livestock production, agroforestry, organic farming and other components of integrated farming system can help to restore and maintain soil health. A healthy soil ecosystems upportsa diverse community of beneficial organisms, including bacteria, fungi, earthworms, and insects. These organisms contribute to nutrient cycling, organic matter decomposition, and pest control. Maintaining soil health fosters biodiversity, promoting a balanced and resilient agricultural system that can withstand pests, diseases, and other disturbances. Also, healthy soils play a crucial role in climate change adaptation andmitigation. Soil organic matter acts as a carbon sink, sequestering atmospheric carbon dioxide and mitigating greenhouse gas emissions. Furthermore, healthy soils with improved water-holding capacity and nutrient availability help crops to cope with extreme weather events, such as droughts and floods, ensuring agricultural resilience.

ClimateResilience

Climate change has a significant impact on agriculture, making it a crucial issue forfarmers, food security, and the overall global food system. Climate change is increasing thefrequency and intensity of extreme weather events such as droughts, floods, and heat waves, which can have adverse effects on crop production and livestock rearing. Shifts in temperature and rainfall patterns can also lead to changes in pest and disease dynamics, further threatening agricultural productivity. Climate-related disruptions to agriculture can lead to increased food prices, reduced food availability, and potential food shortages, particularly in vulnerable regions. Climate change also affects water availability and quality, which are critical for agricultural production. Changes in precipitation patterns can lead todroughts or excess rainfall, both of which canharm crops and livestock. An integrated farming system that diversifies the farming practices and uses climate-resilient crops and livestock breeds can help to mitigate the impacts of climate change which will help in increasing crop production. Integrated farming systems involve growing a variety of crops and raising diverse livestock species. This diversity reduces the risk of crop failure and disease outbreaks. Also, integrated farming system is helpful in reducing carbon dioxide(CO_2) emission and therefore, helps in preventing climate change.

Water Management

Water scarcity in agriculture is apressing global issue that posess ignificant challenges to food production, environmental sustainability, and socio-economic development. With the world's population continuously growing and climate change exacerbating

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water availability, agricultural practices are under immense pressure to adapt and ensure efficient water management. Agriculture is the largest consumer of fresh water resources, accounting for approximately 70% of global water withdrawals. However, thedem and for water in agriculture is outstripping supply in many regions, leading to severe waterscarcity. Several factors contribute to this situation, including population growth, urbanization, industrial expansion, and inefficient irrigation techniques.Water management in agriculture can enhance water use efficiency, increase crop productivity, conserve water resources, and contribute to overall sustainability in agricultural production.

Integrated farming systems for water management refer to a holistic approach that combines various agricultural practices and techniques to optimize water usage and conserve water resources. These techniques involve rain water harvesting, efficient irrigation techniques, conservation tillage, mulching, crop rotation & diversification and selection of drought-tolerant or water-efficient crops. These approaches maximize the crop production efficiency while minimizing waterwastage.

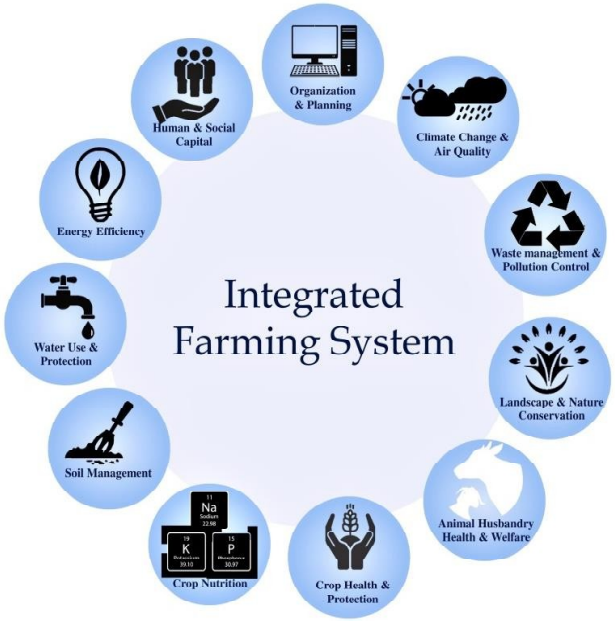

Figure 1: Schematic Representation of Integrated Farming System (Adopted from *WikimediaCommons*)https://commons.wikimedia.org/w/index.php? title=File: EISA Whee l3.jpg & oldid=709188933.|

PestManagement

Integrated Pest Management (IPM) is a key component ofan integrated farmingsystem and offers several benefits to farmers. IPM is a holistic approach to pest managementthat focuses on minimizing the use of pesticides and emphasizes the use of preventive andenvironmentally friendly strategies. Integrated pest management involves practices such ascrop diversification, balance use of fertilizers, and biological control to reduce the use ofchemical pesticides and promote sustainable agriculture. IPM aims to minimize the use of chemical pesticides by integrating various pest management techniques. Farmers are encouraged to use non-chemical methods, such as cultural practices, biological control, croprotation, and habitat manipulation, to prevent and manage pests. This reduces the reliance onsynthetic pesticides, minimizes environmental pollution, and promotes a healthier farming ecosystem. It also recognizes the importance of beneficial organisms, such as predators, parasites, and pollinators, in maintaining ecological balance and suppressing pest populations. By using selective and targeted pest control measures, IPM allows beneficial organisms to thrive and contribute to natural pest control. By implementing IPM strategies, farmers can reduce theneed for costly pesticide applications. IPM promotes the use of ecofriendly and low-residue pest management techniques. By minimizing pesticideuse, farmers can produces a fer and higher-quality agricultural products. Reduced pesticide residues contribute to improved food safety and consumer confidence, particularly in marketsthat have strict regulations regarding pesticide residues. An integrated farming system aims for sustainability and ecological balance. IPM aligns with these goals by promoting environmentally friendly pest management practices. By reducing the use of chemical pesticides, farmers contribute to the preservation of soil health, waterquality, and biodiversity on their farms. This long-term approach helps maintaining the productivity and resilience of the farming system. Overall, IPM plays a vital role in an integrated farming system by promoting sustainable pest management practices, reducing pesticideuse, preserving ecosystem balance, and providing economic benefits to farmers.

Sustainable Agriculture

As the global population continues to grow, sustainable agriculture iscrucial forensuring long-term food security. The conventional agriculture system that relies on chemical inputs and mono culture practices is not sustainable in the longrun, as it leads to environmental degradation and resource depletion. An integrated farming system that adopts sustainable farming practices can help to preserve and improve natural resources, increase farm productivity, and ensure food security. By adopting

sustainable practices, farmers can improve crop yields, enhance soil fertility, and reduce the risk of soil degradation. This helps to meet the increasing demand for food while preserving the capacity to produce food forfuture generations. Sustainable agriculture practices aim to minimize the negative impact on the environment. By using techniques that promote soil health, conserve water, and reduce pollution, sustainable agriculture helps protect natural resources, preserve biodiversity, and mitigate climate change. Sustainable agriculture practices promote resilience and adaptability to the impacts of climate change. Techniques such as agroforestry, conservation agriculture, and crop rotation can help sequestration of carbon dioxide, reduce greenhouse gas emissions, and enhance the ability of agricultural systems to with stand extreme weather events, such as droughts and floods. Thus, sustainable agriculture ensures the long-term viability of food production systems, protects the environment, supports rural economies, promotes human health, and contributes to global efforts to address climate change and achieve a more sustainable future.

Income Diversification

Farmers in India often rely on a single crop or livestock species for their livelihood, making them vulner able to market fluctuations and climate-related risks. An integrated farming system that includes a mix of crops and livestock enterprises, fishery, and other components on a farm can provide multiple sources of income and reduce the risks associated with a single enterprise. By combining crop cultivation with livestock rearing, farmers can benefit from multiple income sources. Proper management of waste from these animals cancreate additional income opportunities for the farmers. For instance, farmers can generate revenue by selling compost or organic fertilizers produced from waste materials. Integrating trees with agricultural crops and livestock can diversify income streams. Trees can provide valuable products and contribute to soil fertility, provide shade for livestock, and support biodiversity. Farmers can diversify their income by adding value to their agricultural products through processing. For example, fruits can be processed into jams, jellies, or dried fruit snacks. Milk can be transformed into yogurt, cheese, or ice cream. Value-added processing increases the market ability and profit ability of agricultural products. Therefore, adopting an integrated farming system, farmers can diversify their income streams, reduce risks associated with single-crop dependency, and create a more sustainable and resilient agricultural systems.

Ecotourismand Education

Integrated farms often offer opportunities for agro-ecotourism and educational activities. Agro-ecotourism is a form of tourism that utilizes rural culture to attract tourists. It emphasizes the potential of agro-ecotourism as a source of income and employment. The integration of agriculture and tourism is seen as crucial for environmentally and socially responsible tourism. Farmers can provide farm tours, workshops, and training sessions for visitors interested in learning about sustainable agriculture. Agro-ecotourism offers the opportunity to combine various agricultural activities such as organic farming, integrated farming systems, value addition, and processing. It suggests the need to create a conceptual framework for the development of agro-ecotourism units for wider acceptance. The activities of agro-ecotourism can be categorized into primary and secondary activities, depending on the socio-economic condition and farmsize of the farmers. Agro-ecotourismun it salso provide ecosystem services such as conserving genetic resources, improving production and profitability, and enhancing soil fertility through residue recycling. The active participation of local communities is highlighted as a means to contribute to local economic development and poverty reduction. Agro-ecotourism in coastal India has significant potential to promote active tourism, enhance farm production, and increase income without harming the environment.

Agroforestry

Agroforestry plays a vital role in an integrated farming system and offers severalbenefits to farmers. Agroforestry is the integration of trees with agricultural crops and/orlivestock. Trees provide numerous benefits in agroforestry systems. They help improve soilfertility by fixing nitrogen, reducing soil erosion, and enhancing nutrient cycling. Trees also provides hade, which can benefit livestock and certain crops.

Additionally, they offer wind breaks, reducing the impact of strong winds on crops and livestock. Agroforestry diversifies income streams for farmers by providing additional products such as timber, fruits, nuts, and medicinal plants. Forests play a crucial role incontrolling soil erosion and maintaining healthy watersheds. By incorporating forests or tree belts into their farming systems, farmers can protect their fields from erosion caused by wind or water runoff. Forests act as natural buffers, preventing soil loss and maintaining water quality. This leads to improved agricultural productivity, reduces the risk of crop damage, and helps

in the preservation of water resources for irrigation and other farm needs. Forests are crucial inmitigating climate change by acting as carbon sinks. Trees absorb carbon dioxide from theatmosphere and store carbon in their biomass and soils. Integrated farming systems that incorporate forests contribute to carbon sequestration, helping offset green house gas emissions. This can provide additional income opportunities for farmers through participation in carbon offset programs or payment for ecosystem services initiatives. Trees also influence the micro climate by moderating temperature extremes, reducing heat stress, and increasing humidity. This has positive effects on nearby crops and livestock, creating more favorable conditions for growth and productivity. Therefore, incorporating forestry into an integrated farming system brings many benefits to the farmers.

Energymanagement

Energy management plays a crucial role in an integrated farming system and offer sseveral benefits to farmers. It involves practices such as using renewable energy sources such as solar, biogas and wind power to reduce the carbon footprint of farming operations. By generating their own energy on-site, farmers can reduce their reliance on grid electricity or fossil fuels.Renewable energy generation systems can power various farm activities, including irrigation, lighting, heating, cooling, and machinery operation. Integrating renewable energy generation into the farming system can lead to significant cost savings. Farmers can reduce their electricity bills by generating their own energy and potentially selling excess energy back to the grid. This can improve the overall financial viability of the farm and increase profitability. Also, farmers can optimize energy use by using efficient irrigation systems, investing in energy-efficient machinery and equipment, and employing proper insulation and ventilation techniques. By reducing energy wastage, farmers can lower their energy costs and improve resource utilization.

Wastemanagement

Waste management plays a crucial role in an integrated farming system and offers several benefits to farmers. Waste materials from livestock, crop residues, and food processing by products can be effectively recycled and converted into organic fertilizers. Composting or vermicomposting can be employed to transform these organic wastes into nutrient-rich compost or worm castings.These organic fertilizers improve soilfertility, enhance crop yields, and reduce the dependence on chemical fertilizers. By effectively managing waste, farmers can produce their own high-quality fertilizers ata lower cost. Integrated farming systems promote nutrient cycling by utilizing organic waste as a valuable resource. For example, livestock manure can be applied to crop fields as natural fertilizer, closing the nutrient loop. This reduces the need for external inputs and minimizes nutrient runoff. Effective waste management ensures that nutrients are efficiently recycled within the farming system, leading to improved soil health and reduced environmental impact. Proper waste management practices, such as containment and treatment of animal waste, help prevent environmental pollution. By managing waste responsibly, farmers can minimize the risk of water contamination from nutrient runoff, which can harm aquatic ecosystems and human health. Waste management also reduces the emission of greenhouse gases, such asmethane, from decomposing organic waste, contributing to climate change mitigation.

Humanand Social Capital

Human and social capital plays crucial roles in an integrated farming system. Human capital refers to the knowledge, skills, and expertise possessed by individuals involved in the integrated farming system. In this context, it involves farmers, farm managers, and workers who actively participate in various farming activities. Their understanding of agricultural practices, such as crop rotation, intercropping, livestock management, and pest control, is fundamental to the success of the system.

Conclusion

Overall, the integrated farming system is the synergistic interactions between different components that result in improved yields and overall farm output. The integrated farming system benefits farmers by promoting sustainability, enhancing productivity, diversifying income, improving soil health, conserving biodiversity, and facilitating knowledge sharing. Integrated farming system also offers opportunities for skill development. Farmers engaging in this approach gain expertise in multiple agricultural domains, acquiring a diverse set of skills. They become proficient in managing crops, livestock, fisheries, and other components, while practicing sustainable and ecofriendly food production techniques. Integrated farming system offers a holistic approach to agriculture that not only improves farm profitability but also contributes to environmental stewardship and long-term agricultural resilience.

Prospects and Avenues of Floriculture to promote Agri Tourism in India

Satya Prakash, Dr. Amit Kanawjia and Ajay Kumar

Agritourism is a worldwide trend, which offers city dwellers a chance to escape urban concrete and re-discover their rural roots. Agritourism is a relatively new market for tourists. The intervention of floriculture and its allied sectors can be implemented in agritourism and can be proved as an excellent strategy to further enhance the potential of agritourism Many state governments have started promoting agritourism which has created new avenues for farmers and rural youths to earn and enhance their income. It has also promoted entrepreneurship among the youths. There is an imperative need for a well-defined strategy for the development of agritourism at national and state level. Proper government supported policy structure of agritourism education of farmers and young entrepreneurs financial support liability and risk management programmes products and service quality improvement are required to boost this sector in India.

Introduction

Tourism is a kind of wandering and roaming for a purpose to experience, learn, business, entertainment, and living and enjoying oneself or with family and friends etc.involves a combination of travel, destination, and marketing, leading to a process in the cultural dimension. Travel and Tourism are considered as one of the world's largest economic sectors and has been reported to support more than 300 million jobs worldwide. This represents 1 in 10 jobs worldwide, generating 10.4% of world Gross Domestic Product (GDP), including directly, indirectly, and induced impacts. In 2018, Travel and Tourism raised 3.9% compared with 3.2% of the global economy (WTTC, 2019).

Besides, traditional tourism, some new concepts are also getting importance in the last few years, most of them related to nature and environment such as Geotourism, Bird watching, Ecotourism, University tourism, Gastronomic tourism, religious tourism, Volunteering, Hot air ballooning, Ethnic tourism, Sports tourism, Garden tourism and Agrotourism. Agritourism is growing fast as a part of the tourism industry and is also increasingly recognized as a means of enterprise diversification for agricultural producers, especially for its ability to increase cash flows to farm and ranch operations and contribute to the overall income. It involves any agricultural operation or activity that brings visitors to a farm or ranch.In off-season's farmers grow flowers and off-season vegetables which would provide a good market for tourists. Presently, the urban population has been going for agritourism as a way of relief from the daily routine of big cities. For this reason, it is one of the most dynamic emerging markets in our country.

Agritourism: Definition and Concept

Agritourism is a portmanteau which is made up of two words blended with two different meanings, that is the agriculture and the other is tourism. Basically, the agritourism is a wonderful combination of agriculture and tourism, and on the basis of definition we can say that it is an indescribable desire of basic feeling for any human race. It is "a commercial enterprise at a working farm, or agricultural plant conducted for the enjoyment of visitors that generates supplemental income for the owner."

Agritourism is a subset of a larger industry called rural tourism that includes resorts, off-site farmers' markets, non-profit agricultural tours, and other leisure and hospitality businesses that attract visitors to the countryside.

Importance of Agri Tourism: Today, Indian cities are facing the problem of overcrowd and environment pollution. Now, it has become an assumed fact that agro-tourism can give us a relief from the hectic life of urban areas. That is why; agro-tourism, eco-tourism and rural tourism are emerging as key sectors of tourism business in India. Most of the studies have proved the due importance and need of agro tourism on the following basis:There are so many benefits of Agri tourism and its related activities for farmers, rural community and tourism operator as under:

- It is a potential way of using farm-based products in a new way, improves farm revenue streams, expands farm operations, develops new consumer markets.
- It provides an additional source of income for the farmers, and gives prestige to rural life and creates

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new jobs at local levels, enhances quality of life for local residence, gives tourists the glimpse of village ambience, local cuisine, culture and art.

- It makes tourists familiar with rural games, traditional dresses, festivals and food.
- It is less expensive in accommodation, food etc., when compared to other types of tourism resulting in expansion of tourism due to its less cost effect.
- Delivers different kinds of entertainment by providing closeness towards the nature and crops, birds, animals, mountains, water bodies, peace and tranquillity.
- It makes urban children aware about village life and works as knowledge and training providing tool for tourists.

Benefits of Agritourism

For Farmers

- Secondary source of income for farmers.
- Promotes locally produced agricultural goods.
- Helps in creation of employment in rural areas among the rural youth creates awareness and helps in set up of entrepreneurial behaviour.

For Community

- Increase in employment opportunities will strengthen the rural economy.
- Provides opportunities to the communities to enhance their local tax bases.
- Traditional knowledge and wisdom of India can be preserved and promoted.
- Helps in protecting and maintaining aesthetic value of the site where agritourism is to be developed.

For Tourism Operators

- Promotes the tourist's market in rural areas.
- promotes the unlocalized currencies in rural economy.

For Tourists/Visitors

- It works as a primary factor in providing experience about the different types of farming techniques practiced on farm.
- It also helps visitors to realize the importance of nature in which they are living.

Inclusion of Floriculture Avenues in Agritourism

There are many ways to promote agri-tourism by the inclusion of floriculture sector.

i. **Through gardens and parks: Garden** tourism contribute to nature preservation, improve an ecological conscience, and increase income Garden tourism or garden visitinghas been suggested as an important segment (niche) on the tourism industry in post-modernity.

Botanical gardens - Botanical garden is a centre which is composed of the collection of living elements of plants powered with the staff for its care and maintenance for scientific study and research.

Modern/Contemporary Gardens - Modern or contemporary gardens can be visited to observe and know the recent trend and masterpiece art of the landscape architect.

Trail gardens - The trail gardens are the exhibitions which are performed by educational centres like universities or the research centres which grabs the attention of local and regional population. The combination of the Trail gardens and the agritourism is mutually helpful for each other in making peoples understand its importance.

Memorial Gardens - Memorial garden is a place which is built with the purpose of conserving and serving the remarkable historical image of someone or something that is special this can also become the good for agritourism.

Medicinal garden – One of the most peculiar and potentially strong section for farmers income this medicinal garden can become as by the collections of very useful, important and rare medicinal species which can be used for educational, knowledge and marketing purpose.

Japanese garden – A very beautiful Japanese garden can be built for visitors to attract and it can become very soothing and relaxing place for the visitors by spreading the peaceful environment of nature among the visitors and it can also become the very best payback feature for the visitors seeking for the peaceful environment unlike cities.

Mughal garden – This is considered as the synonym for the formal garden which can be made by landscaping by different ornamental flowers and trees and plant.

Evolution garden- This type of garden can be created which can give the complete information about the plants evolved from algae the lower plants to the larger plants like the plants under the categories of gymnosperm and angiosperm, which can be used as the demonstration purpose for the students and visitors as well.

Heritage garden – a garden of very old and rare species of trees and plants can be made as in the form of heritage garden which is very rare to get to see anywhere else easily, this garden can become the best example of the proverb i.e., killing two birds with one stone, which will serve as the conservation of old trees and educational purpose and also can become the good strategy of attracting the students school trip to their farm and children and the visitors too.

Palm garden – This type of garden of palms and cycads can also be developed for display as it is of the categories of floriculture and landscaping part and this can also be used for selling the palms to the customers who want to purchase it.

Bougainvillea garden – like other gardens the garden of bougainvillea can also be created, this gives very peculiar look due to its climbing nature when implemented in parkand also this can be used for selling and conservation, preservation and beautification purpose in the floriculture section of the agritourism.

Carnivorous plant garden – this can be different but peculiar section under the agritourism farm for education and learning purpose.

Hydrophytes garden – plants that live in water are known as hydrophytes. Plants like trap, lotus and others have most of their body parts submerged. Other important water plants include the water lilies, sedges and crowfoots which can be used to create hydrophyte garden.

Religious gardens - Religious gardens can be developed for religiouscelebrations or be made for the purpose of place peoples seeking for silence and prayer, it also sometimes foster the history and facts. Some of the religious gardens in India are like-

- **Buddhists gardens** – In Buddhism, gardens are described as a place for meditation and healing. Such type of attractive gardens with monasteries can be made.
- **Nandavanam** - Divine plays (leelas) of Hindu Gods are often depicted in gardens. Most Hindu temples are therefore associated with gardens, also known as Nandavanam. These gardens are usually managed and maintained to serve the temple.
- **Bagh (Bagicha)** – These are the gardens which is furnished with the biodiversity of useful trees and plants such as mango tree, mahua tree etc., near the tanks, settlements etc.
- **Rose Garden** - A different and unique location can be selected for the development of the rose garden. The rose garden can be developed with different species of roses which will attract the visitors, tourists which will engender the new consumers, and which can be very enchanting feature to attract the tourists due to the varying sweet fragrance, colours, shapes of the flowers.
- **Children's-park** - This can be developed with children playing amenities which can become very useful to the children coming with their parent to visit floriculture farm in agritourism.
- **Butterfly-park** - A butterfly house, conservatory, or lepidopterarium is a facility which is specifically intended for the breeding and display of butterflies with an emphasis on education.

ii. Through different attractive floricultural Structures

Glass house - Glasshouse is also known as conservatory. This is a structure built with roofs and walls of glass materials, used for displaying the floricultural products.

Cacti house - The house is a delight to all those who enjoy rare and exotic xerophytes in an exclusive area simulating the natural habitat.

Dry garden - It is also known as 'xeriscaping', which is means the type of gardening which reduces the consumption of water. A dry garden is one that is predominantly hot and sunny with free-draining soil that is built on the pattern of Mediterranean-type planting that can survive in dry or drought conditions.

Green house - A greenhouse is a structure with walls and roof made chiefly of transparent material, such as glass, in which plants requiring regulated climatic conditions are grown, and uncommon floricultural crops can be grown and can be sold by cultivating it in greenhouse.

Rosarium – A rosarium can become of the most enchanting collections in the floriculture area in the

agritourism which can be a very profitable section for the farmers income by its cultivation and collection of different varieties and species.

Orchid house – Like rosarium orchid house can also be built with different varieties and collections.

Arboretum – the collection of trees can be developed to create mass effect like forest of non-local species of trees for different purposes.

Major Agro-tourism Destinations in India: Some of the famous and major agro-tourism destinations in India are as under:

- DewalokamFarmstay Retreat, Karimannoor, Kerala.
- Vanila County, Kottayam District, Kerala.
- Maachli and Dwarka Farmstay, Sindhudurga Region, Maharashtra. -
- Dudhsagar Plantation and Farmstay, Goa.
- Destiny Farmstay, Ooty, Tamil Nadu.
- Acres Wild Cheesemaking Farmstay, Coonoor, Tamil Nadu
- Banyan Tree Farmstay, Coimbatore, Tamil Nadu.
- Thathagata Farm, Darjeeling, West Bengal.
- The Goat Village, Garhwal District, Uttarakhand.
- Prakriti Farms, Rupnagar, Punjab**.**

Agri tourism approaches by the Government in different States

Seeking the immense potential of agritourism in enhancing farmers income and improving their livelihood, many states have adopted it.

- Maharashtra State Agri and Rural Tourism Co-operative Federation Limited (MART) is a federation of agriculturalists and their co-operatives which is in partnership with NABARD and has undertaken training and certification programmes for farmers.
- The Himachal Pradesh Government has recently launched a scheme known as 'Har Gaon Ki Kahani' (story of every village), in addition to 'Home Stay Scheme', which is attracting hoard of tourists to lesser known and remote destinations of the State from last two years.
- The Rajasthan government has decided to promote agritourism vigorously it will help farmers by additional revenues and better sustainability says a report on agritourism in Rajasthan prepared by the FICCI and Yes Bank.
- The Karnataka govt. also launched "agritourism" in its tourism policy 2015 to promote agri tourism.
- Kerala has the pride of starting a rural tourism project at Kumbalanghi near Kochi with assistance from the Department of Tourism, Government of India.
- Andhra Pradesh Tourism Development Corporation (APTDC) in 2017 has come up with a unique concept of agritourism to promote rural tourism which will includehorticulture farms, dairy, fishing, vegetable poly houses etc.
- Agri-tourism initiatives is also encouraged by Telangana Government through various state and central government schemes.

Conclusion

Today agritourism is emerging as a growing market in rural economy. Agritourism destinations helps the tourists to get chance to feel and live in pure and distinct nature from general and normal nature. Inclusion of floriculture and its allied sectors in agritourism is revolutionizing instrument for the generation of rural employment and poverty alleviation.By looking the future and current prospect of floriculture in agritourism initiative, its (agritourism) start-up can become one of the best concepts having the strong capability of increasing farmers income. Thus, the inclusion of floriculture in agritourism can work as the booster concept to promote the rural economy.

Moreover, it is very beneficial for farmers, local communities and tour operators, yet it is needed to develop agro based companies to promote and enhance the floricultural products and its importance in agritourism.Thus, the inclusion of floriculture in agritourism can work as the booster concept to promote the rural economy.

Fruit-based Agroforestry systems in North Western Himalayas

N S Kaler[1], Shivangee[2], SD Sharma[3],RPYadav[4]and RS Dhaka[5]

Fruit based Agroforestry systems are sustainable land use system of North western Himalayas which have higher productivity, higher profitability and earlier returns on investment than sole-crop fruit systems or mono-cropping system. Itprovides diversified products withlarge number of ecosystem services such as erosion control; improve soil fertility and microclimate amelioration.The challenges like tough mountainous terrain, population rise,reduction in agricultural land, minimum land holdings, higher investment cost and an unstable market of sole fruit crop promote the raising of agriculture crop along with fruit trees in an fruit based agroforestry system which is a solution to the native farmers for livelihood improvement.

Introduction

Indian Agriculture is facing manifold challenges and constraints due to our growing demographic pressure, increasing food and fodder needs, natural resource degradation and climate change. Climate change and alteration of temperature are going to become our biggest restraints in achieving our goal of food security in the future. The vulnerability of farmers especially in the Himalayas is exacerbated by the coexistence of intricate environmental issues such as unpredictable weather, resource degradation and climate change. Therefore, a management system must be developed that can provide food security while sustaining soil health and play important role in mitigating climate change.Agroforestry is a brilliant strategy that merges century-old wisdom with contemporary science. It is a traditional approach that has been prevalent in North Western Himalayas for many decades, as witnessed by the trees growing on the croplands. Agroforestry as a conventional land use system and resource management has a significant potential to ensure livelihood security by providing ecosystem services like food, fodder, fuel wood, fruit, timber, and various other non-timber forest products, along with environmental services like watershed protection, carbon sequestration and relief of the antagonistic effects of climate change.

Fruit-based agroforestry system are the sustainable land use system practiced by the farmers in north western Himalayas, in which strategically fruit trees are grown along with other agricultural crops or livestock and creating a harmonious and mutually beneficial relationship between them. The key components of a fruit-based agroforestry system are: Fruit trees (selected on the basis of local climate, soil conditions, and market demand); Crops (including grains, vegetables, or other cash crops); and livestock (sheep, goats, and poultry). Various fruit based agroforestry systems have been developed throughout the decades in the Himalayan region in light of individual needs and site uniqueness at various localities and always appreciatedworldwide world due to its sustainability and large economic gains to the farmers.

Benefits of a Fruit-based agroforestry system:

- **Sustainable livelihoods:** Fruit Production along with agricultural crops can provide the

PrevalentFruit- based Agroforestry systems in North West Himalayas

Fruit trees	Agriculture crops
Apple	Wheat/ Barley/ Maize/ Oats/Rajmash/ Mash/ Soyabeans/ Vegetables (Pea/ Cauliflower/ Cabbage/ Radish/ Carrot/ Capsicum/ Brinjal/ Chilli)
Pomegranate	Wheat/ Barley/ Maize/ Oats/ Rajmash/ Mash/ Soyabeans/ Vegetables (Pea/ Cauliflower/ Cabbage/ Lettuce/ Spinach/ Capsicum/ Okra / Tomato/Brinjal/ Chilli)
Peach	Wheat/ Barley/ Maize/ Mash/ Soyabean/ Cauliflower/ Cabbage/ Tomato/ Capsicum/ Chilli
Plum	Wheat/ Barley/ Maize/ Mash/ Soyabean/ Tomato/ Capsicum
Mango	Wheat/ Barley/ Maize/ Mash/ Till/ Tomato/ Okra/ Capsicum/ Raddish/ Chilli
Litchi	Barley/ Wheat/ Till/ Mash/ Colocasia/ Chilli/ Turmeric
Guava	Wheat/ Mash/ Soyabean/ Colocasia/ Okra/ Tomato/ Brinjal
Citrus	Wheat/ Barley/ Maize/ Mash/ Till/Cauliflower/ Cabbage/ Tomato/ Capsicum/ Okra/ Chilli/ Colocasia/ Turmeric

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diversifiedincome for communities, so farmers become more resilient to economic uncertainties.

- **Food security:** Cultivating of fruit trees along with other crops enhances food security by providing a consistent supply of fruits, vegetables and agriculture crops.
- **Reduced dependency on forest resources:** A fruit-based agroforestry system reduces the pressure on natural forests for fruit collection, thereby promoting forest conservation and preserving important habitats.
- **Climate resilience:**The Himalayas are highly susceptible to climate change and Agroforestry systems with fruit trees can act as carbon sinks, helping to sequester carbon dioxide and mitigate climate change.
- **Biodiversity conservation:** Fruit-based agroforestry encourages the planting of a diverse range of fruit trees with other crops, which in turn supports a variety of plant and animal species contributing to biodiversity conservation in the fragile mountain ecosystem.
- **Ecotourism potential:** Well-managed fruit-based agroforestry systems can attract eco-tourists, contributing to rural development and generating additional income for local communities.
- **Economic benefits:** Fruits are often high-value crops, commanding better prices in local and regional markets and positive interaction between fruit trees and agricultural crops leads to higher profits as compared to a traditional mono-cropping system.
- **Soil Fertility:**Fallen leaves and organic residues from fruit trees enrich the soil, contributing to improved soil fertility and productivity.

Constraints faced by Fruit-based agroforestry systems:

- **Limited land availability:** Due to mountainous terrain and increased population, suitable land for agroforestry might be limited, making it challenging to implement a large-scale system.
- **Market constraints:** Remote locations can present challenges in accessing markets for the sale of fruits, affecting economic viability.
- **Limited technical knowledge:** Farmers might lack awareness of modern agroforestry practices and techniques.
- **Climate change:** Seasonal variations, temperature alteration, changing rainfall and snow patterns can impact fruit tree growth and production.
- **Financial constraints:** The initial investment cost for establishing Fruit based agroforestry systems can be high, which might deter adoption.

Solution/way forward for constraints currently facing:

- **Farmer training and capacity building:** Conduct training programs to educate farmers about best agroforestry practices, including tree planting techniques, pruning, pest management, various combinations of intercrops grown along with fruit crops for different agro climatic zone of Himachal Pradesh sustainable land management.
- **Financial support:** Provide financial incentives, subsidies, or low-interest loans to small scale farmers in order to encourage farmers to adopt fruit-based agroforestry systems. This can help overcome initial investment costs and encourage more farmers to participate.
- **Market linkages:** Facilitate market linkages for fruit products to ensure farmers have access to better markets and fair prices for their produce. This can be achieved through cooperative marketing initiatives or partnerships with local businesses and organizations.
- **Research and extension services:** Support agricultural research and extension services to develop and disseminate knowledge about suitable fruit tree species, intercrops, agroforestry techniques,public- private partnership and innovative practices to improve productivity and sustainability.
- **Climate smart practices:** Integrate climate smart practices into fruit-based agroforestry systems such as water conservation, mulching,fertilization and integrated pest management. These practices can enhance climate resilience and reduce vulnerability to extreme weather events.Although we cannot halt climate change, we can minimize it by climate smart practices.

- **Policy support:** Develop and implement supportive policies and regulations that promote and incentivize fruit-based agroforestry systems. This may include tax incentives, land tenure security, and recognition of agroforestry in national agricultural strategies.

Conclusion

Fruit tree-based agroforestry system has the potential to gain high market value along with meeting the dietary needs of farmers in low-input and limited-land situations.It is the key path to prosperity for farmers and rural people of North Western Himalayas, leading to generation of employment and revenue, meeting other basic needs on the sustainable basis and cushioning farmers from the harness of climate change. In light of the growing demand for sustainable agricultural practices and the need for climate-resilient farming systems, fruit-based agroforestry emerges as a viable solution. This article provides valuable information regarding the potential and capability of fruit-based agroforestry land use systems with respect to carbon sequestration and food security.

Exploring the Synergy of Agro-Tourism and Integrated Farming System

Rohini Verma and Prashant P. Jambhulkar

Abstract:

The essence of agritourism is ultimately experiential, belief-based, and visual. This is a straightforward yet unique experience. Walking a buffalo through a pond, sipping sugarcane juice in a field and scaling a tree are all distinctive experiences for a visitor from another culture. Development of marketing innovations, encouragement of entrepreneurial endeavours, and formation of networks as a means of sustaining agro-tourism with substantial participation from the agricultural community. This conceptualization underscores the importance of collaborative networking between local and external stakeholders in order to promote integrated farming and rural tourism. By doing so, it enables the enhancement of rural communities' assets and capabilities through the synergistic mobilisation of resources.

Introduction

In the agricultural sector, the confluence of agro-tourism and integrated farming has emerged as a potential trend. Agro-tourism is the combination of agricultural operations and tourism experiences, whereas integrated farming is the harmonious integration of various farming systems. This novel strategy has a number of advantages, including sustainable agriculture, rural development, and distinctive tourism experiences. In this essay, we'll delve into the enthralling worlds of agro-tourism and integrated farming, investigating their interconnectedness and the benefits they provide. Agro-tourism allows city inhabitants and tourists to reconnect with nature and acquire personal experience with agricultural living. It includes farm visits, farmers' markets, agricultural festivals, and educational programmes, among other things. Visitors obtain a better understanding of the agricultural process, promote local goods, and help rural economies by actively participating in these activities.Integrated farming is a comprehensive and sustainable methodology that integrates several farming systems in order to optimize the utilisation of resources and mitigate environmental repercussions. The focal point lies in the incorporation of crop cultivation, animal husbandry, aquaculture, and agroforestry. This strategy facilitates the optimal utilisation of land, water, and additional resources while concurrently upholding ecological equilibrium and biodiversity. Integrated farming is an agricultural methodology that encompasses the integration of cattle husbandry, free-range poultry farming, and fruit orchard cultivation within a unified farming system. The primary objective of this integrated system is to optimise productivity, enhance resource utilization, and promote sustainability. Mixed farming is an agricultural system characterized by the integration of several components, such as cattle, poultry, and orchards, which operate in a synergistic manner to yield mutual benefits.

The Synergy between Agro-Tourism and Integrated Farming:

Agro-tourism and integrated farming share a symbiotic relationship that enhance seach other's effectiveness. Let's explore how they complement onean other:

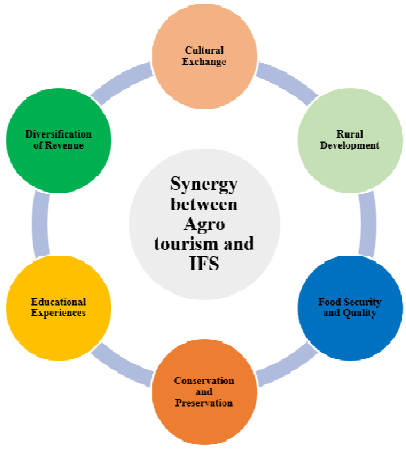

Fig. Components of synergy between Agro-tourism and integrated farming system

Educational Experiences: Agro-tourism offers visitors a unique learning experience by providing in sights into integrated farming systems.

Tourists get to witness the inter dependence of different agricultural practices, foster ingadeeper appreciation for sustainable farming methods.

Diversification of Revenue: Agro-tourism provides farmers with an additional revenue stream

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beyond traditional agricultural activities. By show casing their integrated farming systems to tourists, farmers can generate income through farm visits, farm stays, and on-site sales of farm produce, creating adiversified income portfolio.

Conservation and Preservation: Integrated farming systems prioritize environmental sustainability and conservation. By exposing visitors to these practices, agro-tourismen courages environmentala wareness and responsible farming methods. This, inturn, supports the preservation of local ecosystems and biodiversity.

Rural Development: Agro-tourism and integrated farming contribute torural development by creating employment opportunities, particularly in remote areas. The influx of tourists stimulates local businesses such as accommodations, restaurants, and handicrafts, ultimately improving the socio economic conditions of rural communities.

Cultural Exchange: Agro-tourism facilitates cultural exchange between farmers and tourists. Visitors gain insights into local traditions, cuisines, and lifestyles,while farmers benefit from exposure to diverse perspectives and ideas broughtby tourists. This intercultural exchange fosters mutual understanding and appreciation.

Food Security and Quality: Integrated farming systems often prioritize organic and sustainable farming practices. Agro-tourism promotes the consumption of locally grown, fresh, and nutritious produce. This not only enhances food security but also educates consumers about the importance of healthy food choices and sustainable agriculture.

Examples of Agrotourism and Integrated Farming Systems in India

India is a diverse country with a rich agricultural heritage. It has numerous examples of agro-tourism and integrated farming systems that show case the country's agricultural practices and offer immersive experiences to visitors. Here area few not able examples:

Sikkim Organic Village

Sikkim,a state in north eastern India, is known for its organic farming practices. Several villages in Sikkim have embraced agro-tourism, allowing visitors to experience organic farming firsth and. Tourists can engage in activities like plowing fields, sowing seeds, harvesting crops, and learning about sustainable agriculture practices. These experiences offer insights into the region's organic farming revolution and provide an opportunity to connect with nature.

The Chikmagalur Coffee Estates

Chikmagalur, situated in the state of Karnataka, is renowned for its extensive coffee plantations. Numerous coffee plantations located in Chikmagalur have adopted the practise of agro-tourism, extending invitations to anyone interested in gaining insights into the intricate process of coffee farming. Visitors have the opportunity to observe the diverse phases of coffee production, encompassing the selection of fully mature coffee cherries, their subsequent processing, and the immersive encounter with the intricate craft of coffee brewing. Furthermore, individuals have the opportunity to have a tranquil sojourn surrounded by abundant vegetation and picturesque vistas.

Kerala Backwater Farmstays

Kerala, sometimes referred to as "God's Own Country," is widely renowned for its tranquil backwaters and verdant scenery. A significant number of farmers in Kerala have extended hospitality to tourists by providing them with opportunities to stay on their farms, hence facilitating farmstay experiences. These farmstays provide an opportunity for tourists to observe and experience integrated farming practises, including paddy production, vegetable farming, livestock husbandry, and fishing in the backwaters. Visitors get the opportunity to actively engage in these activities and acquire knowledge regarding the traditional farming techniques and sustainable practises that are implemented in the region of Kerala.

Haryana Agro-Tourism Farms

Haryana, a state in northern India, has several agro-tourism farms that provide visitors with aglimpse of rural life and agricultural practices.These farms offer arange of a ctivities, including tract orrides, fruit and vegetable picking, traditional cooking demonstrations, and handicraft workshops. Tourists can also engage in activities like milking cows, feeding farm animals, and understanding organic farming techniques. These experiences give visitors a taste of the agrarian lifestyle and promote rural development.

Maharashtra Grape Vineyards

The state of Maharashtra is well-known for the expansive grape vineyards that can be found throughout the state, notably in areas like as Nashik and Sangli. A growing number of vineyards are now providing tourists with opportunities to participate in agro-tourism activities, giving them the chance to learn about grape growing and winemaking. Tourists get the opportunity to take guided tours of the vineyards, take part in the harvesting of the grapes, learn about the many processes used in the production of wine, and indulge in wine tasting sessions. The combination of agriculture, tourism, and culinary exploration is what makes these vineyard trips so special.

These examples demonstrate how agro-tourism and integrated farming are flourishing in different parts of India. They not only promote sustainable agricultural practices but also offer tourists a chance to connect with rural communities, learn about traditional farming methods, and appreciate the country's diverse agricultural landscape.

The field of agro-tourism should aggressively involve recognised facilitators, including government entities, local stakeholders, and universities, in order to take advantage of the favourable network effect that stimulates innovation. The research conducted by universities provides essential insights into the ideal practises of sustainable agro-tourism, which may be readily applied to the enterprising community. Furthermore, it is worth noting that both the local government and universities are well-positioned to provide support in terms of capacity building, particularly for businesses that aim to effectively expand their operations. In conclusion, through the process of synergizing their efforts, these stakeholders have the capacity to provide the necessary support, resources, and knowledge transfer that will promote sustainable practises while also ensuring the long-term profitability of the initiatives.

Conclusion

Agro-tourism and integrated farming present a dynamic and sustainable strategy for the advancement of agriculture and rural development. The integration of educational and recreational elements within the realm of agro-tourism, with the holistic principles governing integrated farming, presents an opportunity to establish a symbiotic association that yields advantages for farmers, tourists, and the environment alike. The situation might be characterized as a mutually beneficial outcome, wherein visitors acquire unique experiences, farmers achieve revenue diversification, and rural communities flourish. The adoption of this collaborative interaction has the potential to guide us towards a future in agriculture that is both environmentally sustainable and capable of withstanding challenges.

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