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An Overview of Agroecosystem and its Management

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Abstract

Agroecosystems are natural habitats that have been transformed for the processing of food and fiber, and agroecosystem management combines economic, ecological, and social principles to address problems and identify opportunities. This paper gives all details about agroecosystem and it's Management like meaning of agro ecosystem, meaning of management and primary function of management process. This paper gives also focuses on agroecosystems management and challenges to agroecosystems management. By using sustainable agroecosystems management: Economics, Society emphasizes Integrating Ecology, and the continue centrality of ecosystems perspectives, and need for integrates social considerations ecological, and economic in agroecosystems science and managements. Truly Inter -disciplinary in Scopes with contribution from distinguish leader in field of sustainable agricultures.

Keywords: Agroecosystem, Agriculture, Ecosystem, Environment, Management.

Introduction

Basic units of analysis in agro-ecology is the agroecosystem, which loosely define as functionally and spatially cohesive units of agricultural activity that include both nonliving and living component and their interactions[1].Agroecosystem can viewed as subsets of conventional ecosystems. As names implies, at cores of agroecosystem lie the human activities of agriculture. However, agroecosystem not restrict to immediate sites of agricultural activities (e.g. farm), but somewhat includes region that impacted by that activity, usually from changes to complexity of specie assemblages and energy flows, and to net nutrient balances. To begin, some distinctions are required, such as the distinction between agroecosystems and agricultural technology systems (Figure 1). Agroecosystem is a bounded region that contains a complex of water, air, plants soil, ,microorganisms animals, , and all else that has been adapted for agricultural production. Agroecosystem can be whatever size you want it to be. It may be single field, small family farms, or agricultural landscapes of a village, country and city.

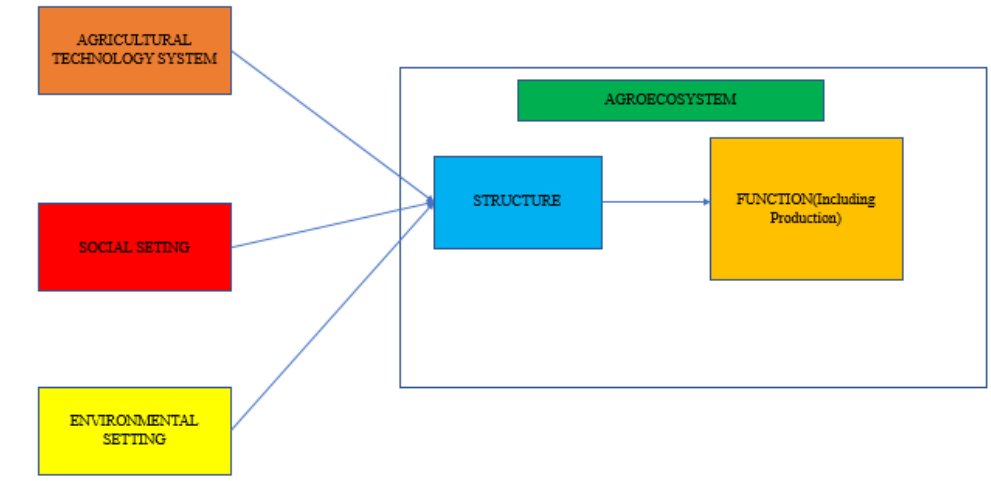

Figure 1: Basic Definition for Agroecosystems Assessment.

Traditionally agroecosystem, particular a manage intensively, is characterize as have a simpler specie simpler energy and composition and nutrient flows than "natural" ecosystem. Likewise agroecosystem is often associate with elevate nutrient inputs, much of that exits farm lead to eutrophication of connect ecosystems indirectly engage in agriculture. Agricultural landscapes occupy approximately 41% of world's surface lands, as well as agriculture is world's most widespread method of land managements. Agriculture's primary objectives are the production of fruit, fiber, and fuel.

Agriculture play a unique role in both demand and supply for different environmental resources as a balanced ecosystem. Power, disclosing the human well-reliance being's on these services Agricultural environments, as seen in Figure. 1, need and offer a range of ecosystem resources, but they also provide disservices. The ecosystem service architecture recently been mentioned in literature, implying the need to improved control of convergence of public and private aspects.

This approach allow for economic valuations of ecosystem resources as well as the integration of multiple value domains. The ES concept reflects on both of the indirect and direct advantages that agroecosystems bring to citizens as applied to agriculture. Ecosystem resources can be divided into four categories, according to the Millennium Ecosystem Assessment: – provisioning ecosystem resources (energy outputs or material), – controlling ES (biophysical process delivering benefit), – supporting ecosystem resources (process required for provide different ecosystem service), and cultural ecosystem resources (spiritual benefits, aesthetic, recreational).

There are many issues that plague rural growth. The inextricable and pervasive relation between agriculture and the environment causes one collection of issues. For agricultural development, we depend on the climate, soil, water, sunlight, and biological organisms. However, in the agricultural production process. Pesticides, fertilizers, equipment, and specially bred plants and animals are among the modern man-made components we add. This engage with the world in a number of ways, sometimes negatively, and often to the point that natural resources vital to agriculture are damaged or lost.

Senanayake (1984) recently provided a clear example of the ramifications of technical innovation on the environment (Figure 2). At first glance, the switch from tractor to buffalo control in Sri Lankan villages appears to be a simple trade-off between more timely planting and labor savings on the one hand, and the supply of milk and manure on the other. Buffalo wallows, on the other hand, are synonymous with buffaloes and have a surprising range of advantages.

They serve as a haven for fish during the dry season, before returning to the rice fields during the rainy season. Some fish are captured and consumed by farmers and the landless, supplying valuable nutrition, while others consume the malaria-carrying mosquito larvae. The thickets are home to snakes that kill rats that eat food, as well as lizards that eat the crabs that destroy the ricebunrls. The villagers use the wallows to prepare coconut fronds for thatching as well. If the wallows vanish, so do these advantages.

Furthermore, the detrimental effects could not end there. If pesticides are used to destroy rats, crabs, or mosquito larvae, contamination or pesticide resistance can arise. Similarly if tiles are substituted for the thatch this may hasten forest destruction since firewood is required to fire the tiles. To begin some definitions are important, includes the distinctions between agroecosystem and agricultural technology systems (Figure 2). Agroecosystem is bounded region that contains a complex of plants, water, animals, oil, air, ls, microorganisms, and everything's else that has been adapted for agricultural productions. Agroecosystem can any size you want it to be. It may be a single field, a small family farms, or agricultural landscapes of village, province or country.

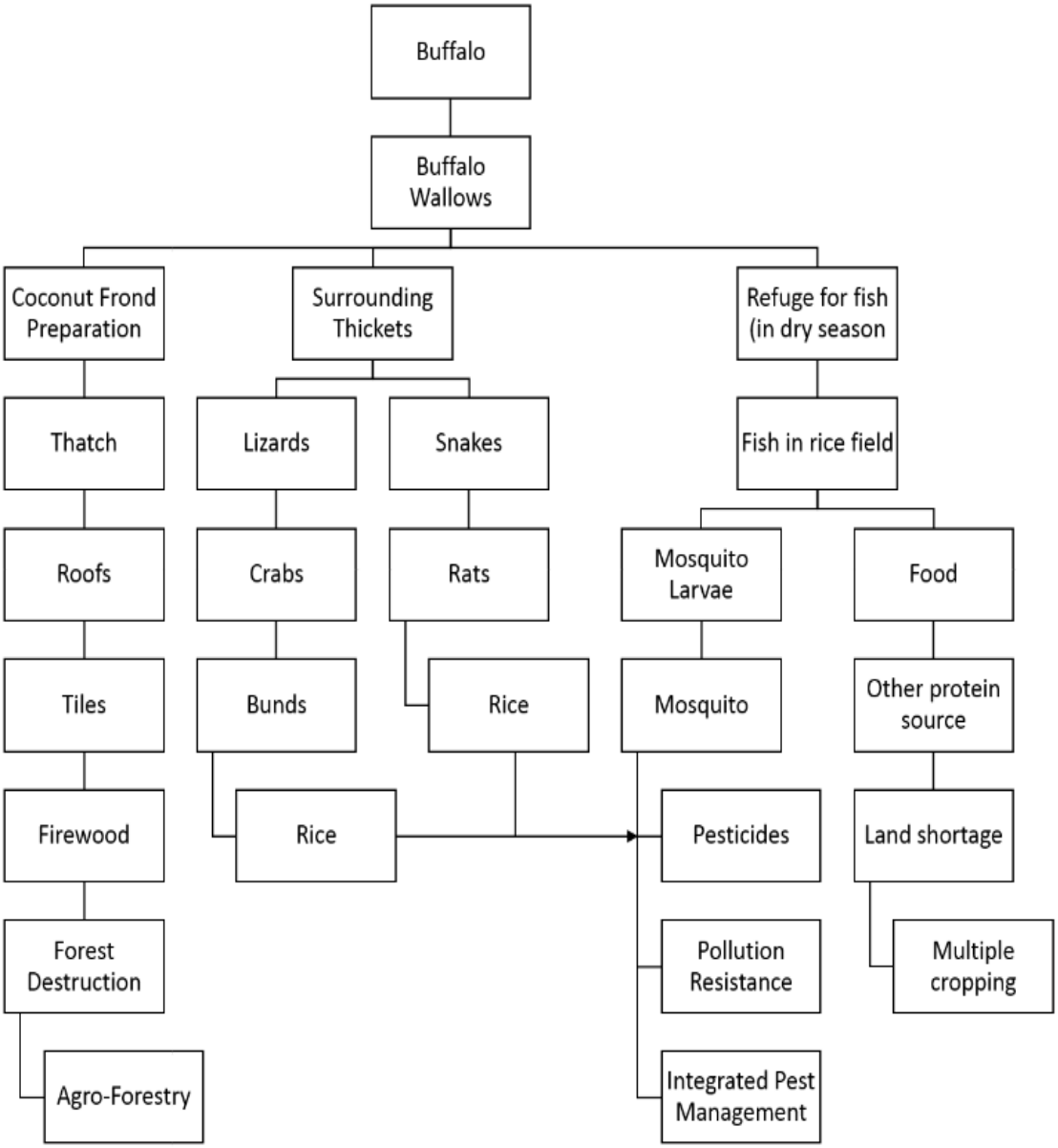

Figure 2: Example of the Ramifications of Technical Innovation on the Environment i.e. the Rice field as an Agro ecosystem.

A variety of major changes are needed to turn an ecosystem into an agroecosystem. The system's borders, at least in terms of biological and physico-chemical boundaries, become better defined. The connections with other networks are narrowed and channeled as they become clearer and less permeable. The method is also made simpler by the removal of many of the existing fauna and flora, as well as the lack of certain natural physico-chemical systems. However, the system is also made more complicated by the advent of human administration and operation.

The organization and administrations of activities for accomplish goal is refer to management. Setting organization's strategies as well as organizing personnel action to meet goals through uses of limited capital are example of administrations activities[2]. Managers must fulfill four main roles in the management process: organizing, planning, leading, and controlling as shown in Figure 3. It's important to note that management isn't necessarily a straight line. Since it is difficult to prepare for any challenge that an organization will face, it does not necessarily begin with preparation and progress over each phase before organizational targets are reached. When unexpected incidents occur during the management process, corrections and revisions are made.

Managers ensure that the requisite improvements are made and that the process's unity and dignity are upheld[3].

1. *Planning:*

Planning entails identify the organization success expectations and decide the activities and service require to accomplish them. Management determine what organization's future should as well as how gets there by preparation. Strategic strategy are long-term and have an effect on the whole business. A strategic strategy connects the dots between where a company is now and where it wants to go. Tactical schedules are used to convert development plans into concrete activities that may be carried out by organizations throughout the enterprise. The tactical plan lays out what is to be done, who will do it, and how much it will cost.

Because of increase competitions from Chinese steels, ThyssenKrupp agreed to becomes an servicing elevator and manufacturing firm. The company management set target for itself to generate the bulk of its sales from elevator-related operations. To do this, the management team formulated tactics to form alliances or buy established elevator firms. The group devised methods for creating new human capital and obtaining external content resources. In order to fund the new program, the firm had to sell its steel related assets. This is example of a long term strategic strategy which can take years to complete and will necessitate many changes. It does, however, begin with the definition of a goal and a tentative roadmap to achieving it.

2. *Organizing:*

Following the formation of plans, choices must be taken on how to better carry them out. The organizing purpose entails agreeing on the configuration of the organization (by departments, matrix teams, job responsibilities, etc.). Assigning power and responsibility to different agencies, allocating money around the organization, and determining how organizations and individuals' efforts can be organized are all part of organizing.

If ThyssenKrupp AG was to meet its long-term target, management had to figure out how to fund two very separate sets of operations. As the priority turned to elevator manufacturing, management wanted to maintain steel production to ensure a steady flow of funds. In order to improve the company's elevator capabilities, it also needed to build new expertise and tools. It was important to create a new corporate framework that could accommodate all company operations when one was downsized and the other enlarged.

3. *Leading:*

People are responsible for almost all of an organization's accomplishments. If individuals in group are unable to help the initiative, even best preparations and preparing would unsuccessful. Leaders use their intelligence, character, and charisma to elicit passion and motivate people to work hard to achieve their objectives. Managers must also inspire high performance by sharing expectations around the organization, fostering dedication to a shared mission, cultivating shared beliefs and community, and promoting high performance. Managers may use the power of reward and punishment to convince workers to support their plans and priorities Leaders encourage people to believe in and stick to their plans. Although leadership and management skills are not synonymous, they do and do coexist in the most successful individuals.

When strategies call for drastic changes, such as downsizing and layoffs, it's tough to keep employees motivated. Many individuals are immune to change by nature. People would be really reluctant to change whether it means losing their jobs or status. The trade unions at ThyssenKrupp were vocal in their opposition to the company's move from steel to elevator production. While those in charge of the new business functions were ecstatic about the preparations, those in charge of steel manufacturing feel lost and demotivated. It would have been prudent for management to seek union approval for its view of the company's new future.

4. *Controlling:*

No war strategy survives contact with the enemy, according to a well-known military adage. This means that while preparing is necessary for making plans, things will not go as expected when it comes time to put the schedule into action. Unexpected incidents will occur. Controlling is the process of seeing and reacting to what actually occurs. Monitoring operations, assessing efficiency, matching outcomes to expectations, and making adjustments and changes as appropriate are all part of the control process. As seen in the example of a product creation feedback loop, this is generally referred to as a feedback loop.

Figure 3: Primary Function of Management Process: Planning, Controlling, Organizing, and Leading.

AGROECOSYSTEM MANAGEMENTs

Agroecosystem managements integrate ecological, social economic value to tackle challenge and discovery opportunity[4]. The adoptions of diversifications in agroecosystem has several advantage including buildings Security operation control(SOC), reduce insects or pests and disease, over times may results in improved crops productivity and additional ecological service[5]. To address problems and discover prospects, agroecosystem management combines fiscal, ecological, and social values. It considers everything from the land under your feet to your neighbors' farms and neighborhoods, as well as the path from farm to market to customer.

- Finding a farming style that pay bills, that your neighbor and society wish for help and defend, and that's your children wants to continues is what it mean to a farmer.
- For a scientist, that means collaborating with farmers at crossroads of agricultural discipline. It involves seeing agriculture as a system, with all challenges and opportunities arising as assets of the system rather than parts of it.
- It mean the frameworks to all your course and experiences, no matters how broads your study is, and connections between focused course and Ohio agricultures to a student interested in agriculture.
- An environmentalist defines it as an agricultural method that improves environmental values such as biodiversity while still being commercially viable.
- For a businessperson, it involves pursuing entrepreneurship opportunities that benefit both the socioeconomic and environmental bottom lines.
- Agriculture can expected to provides nutritious foods from healthy environment and good returns to farmer is what it means to a customer.

- For politicians, this ensures that long term benefits in cultural, economic and social, aspects outweigh shorts term gains in one of these fields.

CHALLENGES TO AGROECOSYSTEM MANAGEMENT

Population development and other demographic changes may have differing effects on habitats over time. More residents would use more energy, putting more strain on ecosystem systems as a result of population growth and urban sprawl. Increasing populations necessitate more habitable and arable land, which often results in the conversion of natural habitats and, finally, ecosystem collapse. The relations between food agriculture, security, climate, and ecosystem resources are becoming overwhelmingly negative.

Reduced yields linked to depleted water quantities and quality, depletion of other natural resources (such as soil fertility), and the simplification of agricultural systems that have lost their intrinsic biotic components for controlling pest and disease infestations are all threats to food security. Unsustainable agricultural practices may have severe, negative consequences for livelihoods and ecosystem functioning, and in the long run, they can stifle or reverse productivity increases, thus increasing poverty.

At the same time, other natural resources such as soil, oil, and phosphorus are expected to become scarce by the end of the century. Farmland reactivation efforts, such as the use of agrochemicals, have a significant effect on other ecosystem functions. Dyes, in practice, have an effect on agroecosystems and their development processes by providing usable ecosystem services.

If the world's population, GDP (Gross Domestic Product), and consumption continue to rise, more demands are made on soil, water, and other services. Poor peoples in fragile ecosystem, mainly that livelihood depend heavily on agricultural activities, can face food insecurity as a result of the degradation. The idea of diversify or multi-functional agroecosystems is relatively new approach to the degradation of natural resource base quality. Agricultural development is now a more dynamic topic with social, cultural, political, and economic aspects, having developed from a solely technological issue[6].

Multifunctional agroecosystems provide a range of environmental services, including soils and water qualities control, carbons sequestration, biodiversity supports, sociocultural services, and meeting food needs. These processes, in turn, depend on ecological services offered by natural habitats nearby, such as biological pest control, pollination fertility preservation, soil structure hydrological services and nutrient cycling.

Bad agroecosystem management, on the other hand, can result in a variety of problems, including the destruction of wildlife’s habitat, nitrogen run-off, waterway sedimentations, greenhouse gases pollution, and pesticides contamination of humans and non-target animals. The challenges of agroecosystem management are discussed in this chapter, as well as how embracing a diversified strategy would enables farmers for farm higher and additional sustainably in unpredictable climate.

LITERATURE REVIEW

Safia Médiène et.al studies for improving pest control and crop nutrition while reducing petrochemical usage in agroecosystems by increasing beneficial biotic interactions and decreasing petrochemicals use. There are 4 agronomic option available. First, they have shown this cultivars selection, nitrogen fertilization and sowing date methods may all be manipulate to avoid pest-crop encounters in time and space. Nonetheless, pest adaptation can restrict the effectiveness of these manipulations. Second, appropriate improvements to ecosystems of natural enemy and ecosystems engineer, mediate by soils and weed managements, can result in beneficial biotic interactions. There is a scarcity of knowledge in this area, and the complex effects and indirect and are no [properly understood. Third, crops diversification and fourth landscapes adaptations have yielded promising results. How-ever, there are certain risks to these activities that cannot be out-weighed by the benefits. General, these 4 managements methods provides a strong foundation for developing long-term agronomic practices[7].

Studies by Lorenzo Brill et al. Biogeochemical simulations model are useful to explaining and quantify agricultural system contributions to Greenhouse gases (GHG) and carbons sequestration sources or sinks status. However, since forecasts from various models indicate significant uncertainty, the proliferation of simulation methods produced in recent decades creates a problem. Difference in biogeochemical and physical processes embedded in equations of Carbon(C) and Nitrogen cycle & their relations are often blamed for discrepancies in the conclusions of various modeling studies. For the potential production of Carbon and Nitrogen models, innovative features have been identified. T. They provide an explicit representations of soils microbial biomasses to drives soils organic matters turnover, the impact of a gas scarcity on SOM decomposition, advances in gas production and use, and adequate simulations of gas transports in soil. On that grounds, assessing patterns and gaining a better understanding of the latest modeling methods used to represents biogeochemical cycle in grassland and crop environments continues to be a critical phase in future study[8].

Anastasija Novikova investigates the ability to pay Water Treatment Plant (WTP) of people in a Baltic country for agroecosystem facilities (Lithuania). After joining the European Union, Lithuania has adopted environmental agriculture schemes to enable farmers to develop agroecosystem services. As a result, knowing the need for such services could assist policymakers in allocating funds. Residents of Lithuania are worried about environmental issues that could be exacerbated by agriculture, according to this report. Furthermore, although provision of agroecosystems services is desired, citizen' preferences for these services are diverse. The use of latent classes model reveals 3 distinct classes of people of varying preferences and WTP levels. Landscape provisions provide the most heterogeneity among the ecosystem resources studied. The findings of their research provide detailed information on the need for agroecosystem sector upgrades through agri-environmental conservation programs. The findings support the conclusion that option experiments are a valid instrument for analyzing consumers' desires in Lithuania when it comes to environmental conservation[9].

Safia Médiène et al. investigate a philosophical and analytical paradigm for studying agroecosystem resilience, in which deciding variables such as agrarian composition and peasant group agency are considered. The approach is used to compare two Latin American peasant societies (Brazil and Colombia), stressing the need to change unsustainable power systems rather than reacting to them. They discovered that where agrarian systems are more egalitarian, and peasant agency is highly established by political development, organization, and women's participation, there is a greater construction of women's agency. Resilience that increases the livelihoods and independence of peasants this application shows that when agency is well established, as it is in Brazil, systemic constraints that limit resilience can be transformed. A participatory methodology allows for the detection of factors that impede or potentiate agroecosystem resistance by including and understanding biophysical variables, management activities, agrarian composition, and agency[10].

The agro ecosystem and its Management was studies and analyzed by many researcher but due to some reasons they do not find the actual reasons behind agroecosystem management challenges etc. This paper gives all details about agro ecosystem and it’s Management like definition of agroecosystem definitions and Primary Function of Management Process. This paper gives also details about agroecosystems management and challenges to agro ecosystems management.

DISCUSSION

There are various researcher who studies and analyzed about the agroecosystem and its management but they did not explain on few topics like definitions of agroecosystem, definition of management, agroecosystem management challenges etc. This paper gives all details about agroecosystem and its management like meaning of agro ecosystem (Agro ecosystem is basic units of research in agroecology, and somewhat loosely define as functionally and spatially coherent units of agricultural activity, and include nonliving and living component involves in unit and their interaction), meaning of management (organization and administration of activity for accomplish goal is refer for as management. Settings the organization strategy and organizing personnel action to meet these goal through use of limited capital are example of administrations activities) ,and primary function of management Process (Planning, Controlling, Organizing, and leading).This paper gives also details about agroecosystems management and challenges to agroecosystems management. By using sustainable agroecosystems management: Economics, Society emphasizes Integrating Ecology, and the continue centrality

of ecosystems perspectives, and need for integrates social considerations ecological, and economic in agroecosystems science and managements. Truly Inter -disciplinary in Scopes with contribution from distinguish leader in field of sustainable agricultures.

CONCLUSION

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