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Review Article

Permaculture: A Sustainable Farming Approach for Modern Era

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Abstract

Agriculture is not merely a science it is an art of living which greatly influence each and every minute sector of the nature. Balancing the needs of a growing global population with the demands of biological diversity necessitates significant changes in how humans produce food at the primary level. When the ever-growing population created a global problem starvation, India moved towards green revolution in late 1960s by using high yielding potential varieties, modern machinery, synthetic pesticides as well as fertilizers. The pattern of unethical resource (land) use drags the ecosystem to its edges of tolerance. Permaculture, being a holistic approach of sustainability with its advanced ideologies pave a way for the environmental sustainability. This wholesome concept, with its worldwide ethical designing practices and core principles acts as a potential approach for diversified sustainable agriculture and a salient solution for varied ecological problems. This review highlights the basic structural framework, core principles and designing processes of permaculture and its role in ecological and agricultural sustainability.

Keywords: Permaculture, Agro ecosystem, Diversity, Principles, Sustainability and Holistic.

1. INTRODUCTION

Permaculture is a sustainable agro ecosystem. The word is the short form of permanent agriculture. As the word suggest, this ecosystem focus on a sustainable agricultural practice which tries to mimics the relationships and patterns of the nature. David Holmgren, The co-founder, interpret permaculture as "consciously designed landscapes, that mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for provision of local needs". In the initial times, the major part was a sustainable agriculture pattern but now after rethinking, permaculture expanded as a social ecological agro ecosystem by considering the fact that land use has always affected the social being of humans. By considering these facts there are mainly three ethical norms which have to be contemplate in management and in upbringing of permacultural designs: (a) care for the society (b); care for the planet as well as (c) parameters to utilization, propagation, and redistribute surplus.

There are some major factors to be considered while planning an agro ecological system. They are: (i) characteristics of the site; (ii) the mutual inter relation among different elements (iii) the spatial preparations of the elements as driving force for various purposes. The biodiversity is followed in the land use through the use of aquatic and terrestrial systems, annual and perennial plants and animal husbandry.

None of the agro ecosystems are created by permaculture. The concept of permaculture is evaluation and modification of the existing ecosystem by considering the criteria s like natural ecosystem being the model of framework and enriching the components in our way to make it economic.

2. The Genesis of Permaculture

Permaculture was initially promoted by two scientists named Bill Mollison and David Hamilton in period around 1970 s. The pioneer book related to permaculture "Permaculture one" got printed in the year 1978. Their movements were a type of critique about the materialistic consumer society, racism, sexism, military rule, and imperialistic society and on a progress, these will end up in the exploitation of developing as well as under developed countries. The development of this system was in such a way that it can act as a substitute against the surplus exploitation of natural non-renewable resources and through this it can help in improving the growth of sectors of energy consumption, consumerist behavior and in moral and political ethics of business

class. Self reliance is the basic and primary norm of the system. In the year 1991, Atkisson stated that they came to the finding that nature cannot be fully conquered out of our rational thoughts and a reframing of the practises and approaches are essential and those practises should be ethical and should give equal privilege to every unit of the system.

Permaculture requires the integration of animate and inanimate units of the system. This policy in permaculture lead towards a new revolution in the civilisation level with three main principles such as care towards the fellow being, care towards planet earth and limits the use of resources as well the redistribution of the obtained surplus within the system. Permaculture tries to follow principles and other conceptual ideas that can guide everyone's actions in this direction. It is therefore defined as "An aid to ethics in decision-making" (Holmgren, 2002).

2.1. Global Overview on Permaculture

It is known to be originated in Australia in the 1980s in developed nations (mainly Australia, the United States, as well as Great Britain) through the improvement of generally small projects which used to aim at increasing the unique self-reliance property of the permaculture with their general concern and respond towards environmental conditions. Their plan is to create well disciplined productive as well as responsible citizens rather than those who are obsessed with the wealth of fuel empowered society. During the period 1990 s the developing colonised southern countries were facing the issues such as the scarcity of resources, in security created by climatic changes and the prevailing social injustice. By the time Non-governmental organizations (NGOs) of pioneer permaculture follower countries tried to strengthen the sustainable development rate of these areas as well as they tried for the resilience of the marginal society. Permaculture Design Certificate (PDC) is acting as a binding force towards the entry into permaculture, but among the other movements on a world level permaculture is less institutional and systemised.

A preliminary typology of permaculture farms in the United States was developed by assessing livelihood diversity and conducting a cluster analysis. Farms were mostly small in size, with an enormous amount of youth as farmers, fresh beginning farmers, and new farms in comparison with national figures. These permaculture farms fit well into the emerging diversified farming systems (DFS) framework and employ an established network of strategies, including enterprises withholding production, to create and sustain diverse agroecosystems (Ferguson and Lovell, 2017).

In 2010, Morrow Gained worldwide recognition for developing and teaching improved permacultural approaches for the poor victim societies of the post war countries such as Africa, Asia and Eastern Europe. Her focus was mainly upon developing nutritional gardens in a peaceful environment which should be easy to maintain with the less available resources and should in return provide required nutrients and a variety of vitamins for protecting the poor people who are under miserable poverty from disease related to poverty. Permaculture was more focused on creating ideologies for the genesis of a society which is able to find alternatives to dependence of fossil fuels and a society which rethink on the ethical norms such as education health, nutrition and habitat and their integration along with transport and local currency exchange (Aiken, 2017).

2.2. Permaculture in Indian Sub-Continent

Bill Mollison, the father of permaculture, visited India in the year of 1986 and laid base stone for permaculture movement in India. They conducted many workshops for farmers and as for individuals who consider an alternate farming practice. Later on, together with an Indian developmental oriented NGO, the very first permaculture demonstration farm was established within the southern region states. Moreover, this they published many books booklets and articles associated with this one. Soon in 1989 The Permaculture Association of India was formed. This acted because the pioneer platform to hold out practical oriented workshops on permaculture and in formation of several agrarian NGOs. Although the organization started its activity in the state it influenced the farmers of the south for an extended period of time, and it developed as a national movement with variety of demonstration sites, events, organizations and lots of the individuals from the nationwide who got excited and influenced with the concept of the movement. The National Permaculture Convergence (NPC) was first organized during the year 2016 by a Hyderabad based permaculture organization, Aranya Agricultural Alternatives, which is one of the pioneer organizations in permaculture hub of India. This national conference has helped to assemble over around 1000 farmers, practisers and academics people who not only curious about permaculture but also in alternative agri practises which conserve biodiversity, promote sustainable living and natural resources management. The India Permaculture Network was systematically originated within this event. Vithal Rajan, Dr L Venkat, a retired doctor who became the father of permaculture in India, and Narsanna Koppula are the pioneers of permaculture in India.

3. Core Vision of Permaculture

The permaculture literature always gives importance to the optimistic part of individuals in the environment, as administrators of ecosystem. Its perception is conveyed through a literature-wide persistence on the need for harmonize and optimistic planning, design and evaluation up to where these styles of management can reach. These two perspectives on human–environment relations cuts against amphibian worldviews of both growth-oriented management and

preservation-oriented management, conflict is among the necessities of society and those of environment. Core of the permaculture vision is the application of ecological and valid plan as well as design. The individual should be able to meet the needs while aggregate ecological well-being.

Permaculture is an umbrella term that refers to a wide range of practices and systems for optimising soil-plant interactions. It efficiently utilises various ecological functionalities to maximise ecosystem health while also providing a broad suite of ecosystem services. (Didarali and Gambiza, 2019)

4. Permaculture Ethics

Ethics constrain survival instincts and self-interest, which often drive human behaviour in societies. These are constantly evolved mechanisms for better self-interest. Early literature pertaining to permaculture did not explicitly state ethics. However, since the development of permaculture design, three broad areas have been used to cover ethics:

- Care for the planet (Conserving water, soil and forests)
- Care for the people or community (Looking after individuals and their kin)
- Fair share or equal sharing (Setting and practicing limits for consumption, adoption and redistribution of excess resources)

These are based on research into community ethics in older religious cultures and modern cooperative groups. The first ethic serves as the foundation for the third and second. Permaculture emphasises learning from indigenous, tribal, and location-based cultures, which have remained in balance with their environment and survived longer than modern civilizations (Holmgren, 2020).

5. Outlook and Design

The design of permaculture is a system which consider the things like ecological aspects, design principles, spatial strategies, while observing site circumstances, to select practices, and to integrate them with the objective of land usage. The ethics of permaculture not only emphasizes the effective functioning of the natural ecosystems but for the activities that work in conjunction with human welfare. In a motive of creating resilient diversified agroecosystems, permaculture adopts certain fundamental principles and ethos (Fiebrig *et al*., 2020). Permaculture can be divided into distinct aspects made up of various elements or measures that address each factor of agricultural production, but when combined, it can solve the problems of modern agriculture. For example, the first strategy addresses biodiversity, the second one concentrates on interactions, the third conjugates creativity and innovation, and the fourth focuses on adaptive management (Ferguson and Lovell, 2014). Permaculture ethics resemble three main sectors of sustainability: society, environment and economy.

6. Designing Principles of Permaculture

Permaculture has long existed as a major driver in sustaining rural economies and cultures, and its underlying principles are similar to multifunctional agriculture. Because permaculture is primarily a design system rather than a rigid set of rules, it is critical to understand how its principles are actually applied in order to critically examine its value in various contexts and its potential as a sustainability guide (Pickerill, 2013).

Design principles are establishing themselves and are used as a framework for designing complex agroecosystems. Several permaculture designers have created their own sets of principles based on the nature of their work (Whitefield, 2004). David Holmgren, the co-founder, developed the most widely used set of permaculture principles. The first six principles take a bottom-up approach whereas the final six are from a top-down designer's concept. This leads to overlaps between the principles. When designing, it's crucial to consider all principles and strike a balance within the system, rather than focusing solely on a few.

6.1. Twelve Core Principles of Permaculture

i. **Observe as Well as Interact:** This principle stands for changing the actions based on observations, interaction and experience about it. For improving resource management, earlier observations are considered.

ii. **Collect and Preserve Energy:** Energy storage is achieved through this principle. Few energy sources include living biomass, wind, water, waste and solar energy. According to this theory, energy should remain in a system to its maximum potential extend. So that we can use it effectively and maintain their functions.

iii. **Attain a Yield:** The term yield includes social benefits, economic yield and ecological benefits, similar to the concept of ecosystem services. The system should also maintain efficiency. Here with a minimum effort comparatively higher yield can be achieved .so efficiency is better here.

iv. **Application of Self Management and Acceptance of the Response:** An ecosystem which can self-sustain and self-regulate is the prime goal of permaculture. Self-regulation and accepting feedbacks involve positive as well as negative feedbacks. Positive feedback as economic yield and other ecological services. Negative feedback involve lower yield, but sometimes even it can be a boon by reducing the pressure over resources. This helps to make the system a self-reliant one.

v. **Value Renewable Services and Resources and Use Them:** It is very important that we have to reduce mistreatment of non-renewable resources, which affect the functioning of the entire system on a long run. In general, this objective aims on increasing the use and functional activity of resources and services.

vi. **Waste Management:** This target at recycling of matter and energy. In a living natural system, nothing goes waste. Output of a component can be the input for some other one. According to this, waste is a resource that can be used to its maximum possible efficiency.

vii. **Designs Created Out of Natural Patterns:** Natural ecosystems can be noted as reference for sustainable use of land, because they developed from an ancient time and it is efficient in functions too. Scientifically the principle is "natural ecosystem mimicry". Patterns/models for agricultural ecosystems can be inspired from grasslands, tropical rainforests etc. In temperate regions, forests with combination of perennial fruit crops and many kinds of fauna like livestock, poultry, goats and pigs. In humid tropical lowlands, the limiting factors will be local biota and nutrient leaching. Here we use the strategy that increases the productivity along with maintaining diverse and complex agro forests with perennial trees.

viii. **Promote Integrations Reduce Segregations:** Biological interfaces, can be utilized to create positive conclusions. Incorporation improves multi functionality of elements. This can create advanced constancy of the agro ecosystem with assimilated pest as well as disease control these integrated activity of species can contribute to cycling of biogeochemical cycles and increases diversity, networks and can create sustainable system against climate change or socio-economic induced risks and hazards.

ix. **Use Steady Slow Small Solutions:** This theory is derived out of Cellular design of species. The principle is based on a hypothesis that small-scale solutions and arrangements are potentially higher in productivity as well as effectiveness.

x. **Value Diversity and Use Them:** This opinion is grounded on the factor stability depends on diversity. Biodiversity produces many ecosystem services. Several studies found that agro biodiversity helps to improve ecosystem services.

xi. **Make Use of Edges and Margins:** The Peripheral Edges will be more varied as well as productive, because the adjacent ecosystems coincide here. Those zones can be purposefully increased to extract the advantage of the effect. Margins are rich of flora and fauna, some could also be pest species, while others is also beneficial like pollinators or predators. This contributes to the sustainability of production.

xii. **Accept and Use Change:** Change is essential for dynamic stability of ecosystem. The agro ecosystem design should have flexibility to use natural change, such as succession.

Principle	**Used in**
Observe and Interact	Design process, management
Collect and Preserve energy	Agro ecosystem structure
Attain a yield	Design process, management
Application of self management and acceptance of the response	Agro ecosystem structure
Value renewable services and resources and use them	Agro ecosystem structure
Waste management	Agro ecosystem structure
Designs created out of natural patterns	Agro ecosystem structure, Design process
Promote integrations and reduce segregations	Agro ecosystem structure
Use steady slow small solutions	Agro ecosystem structure
Value diversity and use them	Agro ecosystem structure
Make use of edges and margins	Agro ecosystem structure
Accept and use change	Design process, management

On whole, Permaculture aims to solve long-term problems by examining the entire system, observing how its parts interact, and designing solutions. This involves identifying patterns in natural ecosystems and learning from past mistakes. The Permaculture approach emphasizes observation of nature, specifically the community of organisms or ecological web (McManus, 2010).

7. Framework and Practices

The twelve principles of permaculture are recognised to be the overall skeleton for creating a sustainable land use system and a well established society with natural constraints (Holmgren, 2002). Land usage in permaculture is similar to that in agro forestry, agro ecology, and traditional land use. Practices are not formulated on a specific framework but the practises are assessed based on two wide principles of ecosystem imitation as well as system optimization. Environment

imitation favours the unmanaged environments as models and attempts to create extremely fruitful systems similar to this in structure as well as function using flora and fauna enrichment which produce benefits for human. System optimization refers towards strategic points which are able environmental intervention those might improve performance better than natural ecosystems.

8. Significance of Permaculture

8.1. In Agroecology

The widespread use of agroecological practices and design principles of permaculture could markedly set down the amount of energy, insecticide usage, and freshwater consumption while also restoring degraded soil, sequestering large amounts of carbon, creating more biodiverse agricultural systems, and meeting human needs for healthy, nutritious food. Furthermore, practicing ecological agriculture may encourage practitioners to develop truly ecological dispositions and worldviews, allowing them to handle problems with appropriate actions from a perspective that meticulously builds sustainability and favours social justice (Hathaway, 2016).

As Ferguson and Lovell have noted, there is significant overlap with agroecological principles. This is especially true for principles such as habitat diversity, nutrient cycling, soil and water storage, and synergistic integration. However, permaculture also includes principles for designing, implementing, and maintaining resilient agroecological systems, such as observing and interacting to cope with change, using minute and gradual solutions, and designing from outlook to details. This also demonstrates that, unlike agroecology, permaculture's primary focus is on the conscious design of agroecosystems, making it a possible bridge between agroecological research and theoretical concepts in combination with practical application of agriculture (Cordell and Drangert, 2009)

8.2. In Ecosystem Services

Permaculture combines crop diversification, perennialization, and nature-sparing, all of which target different but related beneficial ecosystem properties and processes. Permacultures may thus provide more total ecosystem services and resilience than systems that use these constituent techniques in isolation. Regulatory and supporting services like pollination, nutrient cycling, and refugia frequently have an impact on provisioning services like crop yield and stability, either directly or indirectly. The magnitude and direction of effects are determined by genetic, management, and environmental factors, specifically community and landscape composition and configuration. Permaculture may be especially well suited to promoting ecosystem services in low-input, degraded, marginal, and least-profitable agricultural areas, where effect sizes are most visible (Hirschfeld and Acker, 2021).

8.3. In Agricultural Farming Systems

When viewed out of a practical focus the system is having many similarities with other agricultural systems such as agro ecology, organic farming, biodynamic farming and even agro forestry. These all systems have their similarities in their relationship between animate and inanimate things. Permaculture is having a varied landscape which is similar to biodynamic farming and organic farming but here we pay more attention towards the soil fertility maintenance and improvement. The main common factor among agro forestry, organic farming, biodynamic farming and all with permaculture is their similarity in unity and harmony and even respect. Each system has its evolutionary history. The roots of biodynamic farming lie on theosophical views, organic and ecological farming has its origin from the thoughts of peasant empowerment and renaissance views of political groups. The root of permaculture is in the deep thought of self reliance and community sufficiency. While comparing this system with others we can move towards a common point that is conscious global view of natural ecosystems and habitats than their priority towards specific techniques or tools. The main aims of the design tools are to maximise the elemental interactions, manage the restrictions and avoid special importance to any element provide harmony and peace among the elements. The design of permaculture mainly aims to maximize interrelations among the elements and in maximising the yield out of limited resources. This system explains the importance of ecological engineering in systematic dimension and in style for sustainable design of ecosystems. (Mitsch and Jørgensen, 2003)

8.3.1. Tillage

Tillage in the system is almost nil as an alternative the soil used to be covered with plants or organic mulching materials for proper development of soil micro flora and in improving the structure as well as for beneficial organisms for humans. By the method carbon can be assimilated as well the emission and erosion can be reduced. Shrubs and other trees are vital in carbon assimilation and have its key action in energy capturing as well as nutrient cycling. The planting is done around the point of human interference and the positioning is based on the requirement of human interface for plants, upto zone 5 used to be there and the last zone mostly remain fully untouched, maximum utilisation of the edges and margins of the system is done (Mollison, 1988).

8.4. In Human Welfare and Empowerment

In developed countries, modern urban civilisation gained popularity during the 19th century and fledged its wings along with western culture and globalisation. A philosophical thought is gaining popularity among the scholars that the view of modern world which is earth is a reservoir of resources that should be exploited effectively for a long run could be a major threat faced by the humanity. Permaculture

promotes its practisers an opportunity to build a positive bonding between the planet and the places we live in. Through this system even new comers can become indigenous people by acquiring the indigenous knowledge and will develop the skill to interact with the local environment as well as society. The people can develop better skills for being more self reliant and sufficient, They can change their nature from demanding and depending nature towards responsible as well as independent producers.(Holmgren, 2002) Permaculture is a better system of cultivation for surviving in post industrial era and to organize without being dependent on fossil fuels.

9. Advanced Permaculture Technologies

9.1. Integrative Permaculture and Smart Technology

Regenerative agriculture, permaculture, and smart technology have evolved in response to the need for sustainable agricultural production, an agricultural decision support system, and global food security. Collectively, regenerative agriculture and permaculture are semi-closed holistic systems approaches designed to reduce or eliminate reliance on external inputs (e.g., synthetic chemicals) while restoring and maintaining natural systems. Adopting modern regenerative agriculture and integrated permaculture will benefit ecosystem biodiversity, soil health status agricultural sustainability, land and resource conservation, and food security. It is critical to identify and implement practices for regenerative agriculture, integrated permaculture, digital agriculture, and sustainable agricultural management that use modern agricultural technologies infused with data science (artificial intelligence or machine learning) (McLennon *et al*., 2021).

Application of several properties evapotranspiration, electrical conductivity, canopy cover, vegetation index and water stress in the inclusion of spatiotemporal imagery using multi and hyper-spectral mapping allows precise, optimised, and sustainable management of agricultural crops (Nocco *et al*., 2019).

9.2. Permaculture and Sustainable Agriculture with AI

Permaculture and regenerative agriculture should be combined with modern agricultural technology and the use of data sciences such as AI and ML to provide a diverse range of beneficial input services. These, in turn, will help to achieve long-term food security because their ethos focuses on lowering production inputs while also reducing environmental footprint. Agroecosystems, which share the underlying principles of permaculture and regenerative AI, take a holistic approach rather than focusing on individual elements. It is useful to investigate how different systems and their interactions can yield overall system benefits. These approaches should be viewed as part of a larger set of measures, matrices, and efforts to intuitively approach sustainable food security goals. Scientific data quantifying the effectiveness of permaculture practices and their respective role in future agriculture is required and will be critical to promote their adoption.

10. Controversies, Criticism and Research

The relationship between permaculture and ecological science is often troublesome till date. The important criticism received about permaculture is for over simplifying the facts and for overreaching. Humanity possesses knowledge enough to switch the degradation of current land use, and it's straightforward and there is no need of a new design named permaculture. Till date the case studies associated with permaculture are limited and because of that the permaculturists used to believe a very few case studies, and they are over depend on ecological principles for proving many of the permaculture principles. As the research associated with permaculture is restricted to many of the available permacultural texts, it has not much scientific backbone. Many of the permaculture documentation is included in grey literature, therefore there exist a limitation in accessing and in verifying. The design is in its blooming stage and contemporary developments are still not enough to clarify the things in permaculture, the system still contains a few ideal conditions and technologies which can mislead and may result in the development of pseudo scientists and pseudo-science findings. During the same time permaculturists are on the side that scientists and research institutes aren't promoting the ideas proposed by them and are being reluctant, but opponents are claiming that permaculturists aren't ready for scientific studies why because scientific studies will certainly discard the findings of permaculture. As example of oversimplifying the things they're explaining that permaculture compares agricultural productivity with permacultural productivity but at some point, of optimum resource management and within the long-term permaculture productivity can get equalized with normal systems as in other organic cultivation systems. The permacultural system has less systematic organization and institutionalization because of its mere developments. The key criticism obtained in permaculture was socio-economic criticism. The critics explain that permaculture could be a practice developed by westerners. Their aim is to supply green permaculture practice to developing countries during a mask of humanitarian activity to develop neo colonization, But the wording was objected by permaculturists. The scientific literature in permaculture explained that permaculture principles are associated with individual observations and collective learning and therefore the technique helps in empowerment of poor communities instead of providing them with ready-made solutions provided from developed countries. Permaculture helps people by providing them organizational tools and conception ideas for designing their own solutions (Conrad, 2014).

Another criticism is that they're failure in acknowledging their similarity with other systems, as an

example of this statement they mentioned that the system has major similarity with indigenous land use cultures and to tropical multi tier homestead garden, but they merely changed the name of the technique as food forest or edible forest garden. Home gardens of tropical areas like Javanese home garden and Creole gardens in West Indies use many multi-purpose trees and plenty of shrubs and also included association with annual perennial crops and livestock which is comparable to permaculture (Fernandes and Nair, 1986). The founders of permaculture, Mollison and Holmgren, considered these facts and clearly acknowledged their role in permaculture and permaculture serves indigenous knowledge for creating sustainable human development (Mollison, 1988; Holmgren, 2002). Mollison and Holmgren collected traditional knowledge from the global level and combined those with other elements of knowledge to make new local cultures with hybrid vigour (Holmgren, 2002). The poor communities of the many developing countries treat permaculture as their sort of assuring and preserving traditional knowledge what their ancestors have handed over to them (Conrad; Millner). Even few studies have mentioned that the poor communities of developing countries are treating permaculture as a tool of traditional ecological knowledge what they need which is capable of constructing them able to compete with contemporary world (Millner, 2016). Amidst of these, conflict on using of indigenous technologies in permaculture and ecological engineering may be a common topic for further research among anthropological and sustainability students. (Veteto and Lockyer, 2008). The significance of scientific data quantifying permaculture practices in future agriculture is required and will be critical in promoting their adoption. Furthermore, a more robust and holistic research direction is required to integrate all aspects of food production for overall socioeconomic upliftment and farm productivity while managing nature in the face of extreme weather events and climate change.

11. CONCLUSION AND FUTURE PERSPECTIVES

Permaculture has its own various themes and patterns which made the system a bit of confusion and even the systematic research on the field is being limited. The ideal aspect raised by the system was noted as impractical by many of the scholars from around the world (Ferguson and Lovell, 2014). From long back from the period of emergence of permaculture the academic studies were majorly focusing on different fields such as architectural field, educational field and even in the field of social and behavioural sciences. The papers were mostly including the basic facts of permaculture along with few principles and applications but the permacultural style is existing from long way back still from a scientific point of view not much studies related to practical applications, feasibility of adopting the technique in agricultural field and other aspects related to life science and ecology is not yet done, even though countries like US and France have done some studies. Permaculture has its ability to provide methods and tools to design a system with a very good labour efficient and resource efficient farming system meanwhile it maintains greater level of biodiversity and even beneficial ecological interactions.

In highly industrialised countries like France and US they have already proven that the productivity and economic returns (comparing with its resources and labour requirement) of commercial permacultural systems could benefit the society with a higher level of crop diversity crop animal interaction and integration and low level of fuel consumption (Morel *et al*., 2016; Ferguson and Lovell, 2017). For building a greater acceptance from the public some permaculture farms used to conduct training and cultural activities with logic of pluriactivity which can enhance their source of income. But the strategy is creating wider criticism from those who are against permaculture they have stated that in permaculture the income will only come from teaching the technique and ever from practising the system for productive farms. But many farms are there which are focusing on production aspect rather than teaching aspect and even the production level. The inputs, labour and even income of permacultural system is very much similar towards other systems such as diversified farming, organic, agro ecological and low input farms. (Ferguson and Lovell, 2017; Morel, 2016).in the new era permaculture practisers are experiencing agricultural economic environmental and nutritional benefits higher than those farmers following conventional agricultural practises. This pattern was observed in Malawi by Conard in 2014. In 2015 Permaculture International Research Network (PIRN) which is sponsored by UK Permaculture Association included over 40 countries. During recent tears the trend of appearing permaculture related publications in journals has raised and even more and more universities are developing research projects about permaculture and these things can clearly provide the scope of future developments in the field.

Practical experience and technical knowledge are essential for applying permaculture design principles effectively. However, they can serve as a framework for generating and evaluating site-specific solutions, allowing for progress beyond current limitations. The success of sustainable development lead to a reunification of culture and nature.

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