



Exploring the Contributions of Sociology towards Attaining Agricultural Sustainability

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Abstract

Sustainability is the principal component of state-funded college study activities and development associations. Some improvement, be that as it may, is the prevailing worldview of traditional farming. Farming discoveries are water, soil and air pollution, normal asset debasement and biodiversity misfortune. Considering these emergencies and the push to discover an exit plan, this paper, in light of the assessment of present-day literature, asserted that we should change from a technocratic approach to a social arrangement framework so as to support sustainable agriculture. Agriculture ought to be viewed as an act of human instinct. Hence, the reason for this audit paper is to research sociology's commitment to achieving agricultural sustainability. The exploration shows that agricultural sustainability can never again disregard human measurement and social segments at the centre of agricultural development. Albeit rustic and normal sciences are basic, sociology needs to assume its job in inquiring about the human viewpoints that are basic to

understanding and sustainability in agriculture. The commitments of sociology to sustainable agriculture incorporate investigating the ideal models used to decipher sustainability, progressing sociological models to clarify mentalities and practices, and illuminating policymakers about the social effects regarding assessing sustainable agricultural approaches. To understand the objectives of this study, a qualitative methodology and a secondary method of data collection were additionally utilized. This approach depends on an impressive volume of related literature.

Keywords: *Sociology, Sustainable agriculture, agricultural improvement, climate change, Cultural Norms*

Introduction

Agriculture Sustainability is meeting cultural sustenance essentials in the present without trading off the limit of people in the future to address their own needs dependent on comprehension of biological system benefits, that is, the examination of associations among life forms and their condition (Agricultural Sustainability Institute, 2019). It is a long haul methodological structure that breakers advantage, natural stewardship, decency, wellbeing, business and familial of a sections ranch setting. It is portrayed by 3 fundamental perspectives which are: financial profit, natural stewardship, and social duty. Supportability focuses on the business method and routine with respect to a ranch when all is said in done, instead of a specific agricultural item. Agricultural

Sustainability can be comprehended as Practices that can cause long haul mischief to the dirt which fuses the unrestrained working of the dirt (prompting disintegration) and water system without adequate waste (provoking salinization). Literature has indicated how unique human practices impact soil properties principal to sustainability (Altieri, 1995). The most noteworthy components for an individual site are climate, soil, supplements, and water. Of the four, water and soil quality and amount are generally pleasing to human mediation through time and work.

Problems

On the off chance that one recognizes the conflict that the possibility of agricultural sustainability is to satisfy

human nourishment and fibre needs, to improve ecological quality and the normal asset base whereupon the agricultural economy depends, to make the most proficient utilization of non-inexhaustible and on-ranch assets and incorporate common organic cycles and controls, to continue the monetary reasonability of homestead tasks, and to upgrade the personal satisfaction for farmers and society in general (Gold, 2009), Sociology at that point has a lot to offer so as to accomplish sustainability in agriculture. Understanding what agriculture and sustainable agriculture are is essential for understanding sociology's job in Nigeria's sustainability of agriculture.

Methodology

To realize the objectives of this study, the paper adopts a qualitative methodology and a secondary method of data collection was also used. This article involves data collected from past literature available on employment strain and job satisfaction. The secondary sources of data includes data from published and unpublished sources including journals, internet etc. The review of related literature provided a wide range of scholarly reflections and arguments on the subject matter of the paper. To this end, the paper is essentially a concept paper that reflects on scholarly perspectives on exploring the contributions of sociology towards attaining agricultural sustainability.

Brief review of literature

This section of the paper reviews some literature that is relevant to the subject matter

Conceptualizing the term Agriculture

The word 'Agriculture' is gotten from the Latin word 'Ager' signifies Land or field and 'Culture' signifies development. It implies the science and Art of creating harvests and domesticated animals for a monetary reason. Agriculture is a craft of raising vegetation from the dirt for the utilization of humanity. Agriculture is the achievement throughout the entire existence of human progress, because of agriculture man settled at a specific spot. Agriculture is one of the most seasoned and prime exercises of individuals. It has stayed a significant wellspring of land. Despite developing industrialization and

urbanization on the planet, almost 50% working populace despite everything occupied with agriculture (Wikipedia, the free Encyclopaedia, 2019). In creating Countries the agriculture division has been a significant wellspring of work and it has added to the national economy. The fundamental point of agriculture is to raise more grounded and increasingly productive yields and plants and to help them for their development by improving the dirt and providing the water (Wikipedia, the free Encyclopaedia, 2019).

Agriculture is the way toward delivering nourishment, feed, fibre, and numerous other wanted items by the development of specific plants and the raising of trained creatures (animals). The act of agriculture is otherwise called "farming", while researchers, creators, and others dedicated to improving farming methods and executes are additionally said to be occupied with agriculture (Lélé, 1991).

Business concentrated agriculture, including mechanical agriculture, includes enormous fields or potentially quantities of creatures, huge asset inputs (pesticides, composts, and so forth.), and a significant level of motorization. These tasks by and large endeavour to augment monetary salary from grain, produce, or animals. Present-day agriculture broadens well past the customary creation of nourishment for people and creature takes care of.

Other agricultural creation products incorporate timber, manures, creature covers up, calfskin, mechanical synthetic concoctions (starch, sugar, alcohols and tars), filaments (cotton, fleece, hemp, silk and flax), energizes (methane from biomass, ethanol, biodiesel), cut blossoms, decorative and nursery plants, tropical fish and winged animals for the pet exchange, and both legitimate and unlawful medications (biopharmaceuticals, tobacco, opium, cocaine). The twentieth Century saw enormous changes in agricultural practice, especially in agricultural science. Agricultural science incorporates the utilization of compound compost, substance bug sprays, and synthetic fungicides, soil cosmetics, investigation of agricultural items, and dietary needs of livestock. Starting in the Western world, the green upset spread huge numbers of these changes to ranches all through the world, with differing achievement (Lélé, 1991).

Other late changes in agriculture incorporate hydroponics, plant reproducing, hybridization, quality control, better administration of soil supplements, and

improved weed control. Hereditary designing has yielded crops that have capacities past those of normally happening plants, for example, better returns and ailment opposition. Altered seeds sprout quicker, and therefore can be developed in an all-encompassing developing territory. The hereditary building of plants has demonstrated questionable, especially on account of herbicide-safe plants. Starting at 2006, an expected 36 per cent of the world's specialists are utilized in agriculture (down from 42% in 1996), making it by a wide margin the most well-known occupation (Lélé, 1991).

One of the valuable meanings of agriculture is expressed by (Speeding, 1996), who opined that "agriculture is a movement of Man, did principally to deliver nourishment, fibre, and fuel, just as numerous different materials by the conscious and controlled utilization of mostly earthbound plants and creatures." The expressions "agriculture" and "agricultural framework" are utilized broadly to incorporate different parts of the creation of plant and creature material of nourishment, fibre, and different employments. For investigators with a restricted vision, these terms are constrained to the development of the dirt and the development of plants. Be that as it may, for other people, the terms additionally incorporate financing, handling, advertising, and conveyance of agricultural items; ranch creation supply and administration businesses; and related monetary, sociological, political, ecological, and cultural attributes of the nourishment and fibre framework (CAESS, 1988). Since agriculture includes financial matters, innovation, governmental issues, sociology, worldwide relations and exchange, and natural issues, notwithstanding science it very well may be reasoned that agriculture is social as much as agronomic and environmental (Karami, and Keshavarz, 2010).

Taking a wide understanding, agriculture is an arrangement of procedures that occur inside a triple ecological system, biophysical condition, socio-world of politics, and monetary and innovative condition. Together, these three arrangements of variables set the wide limitations inside which people, gatherings, and governments take part underway, circulation, and utilization segments of agriculture (Karami, and Keshavarz, 2010). These three arrangements of requirements for agriculture additionally give a method for evaluating conditions for sustainable agriculture (Yunlong and Smith, 1994). Agricultural sciences can never again overlook the human purposefulness and

social elements that are the foundations of our pickle. In spite of the fact that the normal sciences, and particularly the earth and life sciences, stay of crucial significance (De Groot, 1992), sociology must assume its job among the agricultural sciences to investigate human action as new from purposefulness and covetousness, financial frameworks, human learning, and understanding (Roling, 1997).

Contribution of Sociology toward attaining Agricultural Sustainability

Sociologists and other social researchers have assumed a critical job in the development, standardization, and format of sustainable agriculture. Sociologists and other social researchers have done particularly colossal research at the selection of asset holding rehearses. They have additionally made significant commitments through their examination into distinguishing purchaser wishes and execution procedures alluding to the sustainable agriculture period (Buttel, 1993). For some researchers, sustainable agriculture lies at the coronary heart of another social understanding among agriculture and society (Gafsi, Legagneux, Nguyen, Robin, 2006).

This paper contends that sociology and the other sociologies play a likewise critical and hopeful job in comprehension and accomplishing agricultural sustainability. Buttel (1993), shows that this type of use of sociology can be known as the sociology of agricultural sustainability. The central commitment of the environmental factors improvement banter is the conviction that further to or along the edge of those biological conditions, there are social conditions that influence the biological sustainability or unsustainability of the people nature interchange (Lélé, 1991). On occasion, be that as it may, sustainability is utilized with basically social meanings. For instance, Barbier (1987), characterizes social sustainability as "the capacity to keep wanted social qualities, conventions, organizations, societies, or other social attributes." This use isn't extremely typical, and it should be warily outstood from the additional ordinary setting wherein social researchers talk about sustainability, viz., and the social variables of natural sustainability.

Sustainability as a social vision seems to be, without a doubt fitting, yet does, in truth, meet with correspondingly expansive endorsement all through every single cultural gathering and political positions, broadly and globally. As fast

as genuinely solid objectives or perhaps strategies of cultural movement for achieving sustainability are put on the time table, on the cutting edge, it will become obvious that the regular old unfavourable cultural qualities and interests are sneaking in the rear of the automatic agreement (Grunwald, 2004).

Regardless of the assorted variety in conceptualizing sustainable agriculture, there is an agreement on three fundamental highlights of sustainable agriculture: (i) upkeep of ecological quality, (ii) stable plant and creature efficiency, and (iii) social worthiness. Reliable with this, Yunlong and Smith (1994), have likewise recommended that agricultural sustainability ought to be surveyed from biological adequacy, social agreeableness, and monetary practicality points of view. "Biological sufficiency" alludes back to the upkeep and advancement of the indigenous habitat, "financial reasonability" alludes to the support of yields and productiveness of harvests and livestock, and "social agreeableness" alludes to independence, equity, and improved high-calibre of life (Rasul and Thapa, 2003). Sociology of sustainable agriculture, as indicated by (Karami and Keshavarz, 2010), manages the accompanying issues: Sociological models progressed to give a clarification for perspectives and practices, and Social effect assessment and sustainable agriculture.

Sociological models advanced to explain attitudes and behaviours

Attitudes are depicted as an aura to answer well or horribly to an item, man or lady, association, or occasion. An attitude is (a) directed toward an object, person, institution, or event; (b) has evaluative, positive or negative, elements; (c) is based on cognitive sustainable agricultural attitudes and behaviours beliefs toward the attitude object (i.e., the balancing between positive and negative attributes of an object leads to an attitude); and (d) has consequences for behaviour when confronted with the attitude object (Bergevoet, Ondersteijn, Saatkamp, Woerkum, and Huirne, 2004); (Karami, and Mansoorabadi, 2008). Attitude is a predisposition to behave in a certain way. It is the state of readiness that influences a person to act in a given manner (Rahman, Mikuni, and Rahman, 1999). Therefore; attitude surveys in agriculture could lead to a more adequate explanation and prediction of farmers' economic behaviour and have been used on conservation and environmentally related issues focusing on the

influence of attitude variables as predictors of conservation behaviour (Dimara and Skuras, 1999).

Dimara and Skuras (1999), finished up from their exploration that a huge relationship was found among conduct and the objectives and aims of farmers. This relationship is much more grounded when proclamations on attitudes, social norms, and saw conduct control are incorporated (Bergevoet, Ondersteijn, Saatkamp, Woerkum, and Huirne, 2004). Study on farmers' conduct and what propels that conduct is not new (Gasson, 1973). In any case, the assortment of studies that have considered farmers' attitudes towards preservation is little (MacDonald, 1984). Less despite everything have contemplated farmers' preservation developments. Potter (1986), calls attention to that a completely limited wide assortment has endeavoured to connect farmers' moves to their basic inspirations, despite the talks on the preservation issues in the wide-open (Potter, 1986).

Practically all investigations identified with the inspirational components of conduct have focused on that the choice to act with a particular goal in mind is influenced by an "adjusting" or weighing of various impacts. Lemon and Park (1993), inferred that farmers, when attempting to accomplish "great practice" on their ranches, balance ecological, physical, and business factors in their choices about their farming framework. Clark (1989), forewarned that farmers' choices about whether to take proposals about protection were influenced by three particular measurements: the approach condition confronting farmers, the warning frameworks in the spot, and the character of the rancher.

Conversations of the incentive to be credited to the protection of a characteristic framework summon two particular wellsprings of significant worth: extraneous and inherent qualities. Outward worth emerges from the way that nature builds the fulfilment or utility of people. Right now, nature has esteem insofar as it is helpful or pleasant to people. The inborn estimation of a characteristic framework exists regardless of its helpfulness or courtesy to people. This view expressly gives rights to exist to nonhuman species or to nature in general. The inborn worth approach may along these lines require chiefs to settle on choices purposely counter to their own presence on future interests (Pannell and Schilizzi, 1999). Potter, (1986), see any substitute inside the wide-open as,

"both 'dictated' by methods for arrangement, institutional, and family impacts and 'intentioned' by the rancher going about as an issue fixing man or lady."

This investigation varies from most past investigations of farmers' preservation conduct as in it doesn't unequivocally consider farmers' interest in protection as some others examine (Potter, 1986); rather, it is worried about how and why farmers deal with the current highlights on their homesteads (supports, field edges, woods, and trees). This distinction is pivotal as there is impressive proof (Potter, 1986); (PIEDA, 1993), recommend that most farmers have an "inventive" instead of "additive" perspective on preservation. A large portion of the past research shows that guidance on tree planting, lake creation, and forests is most normally looked for and that leaving semi-common zones undisturbed isn't viewed as protection (Beedell and Rehman, 2000). Newby Bell, Sanders, and Rose, (1977), found that ranch size alone couldn't clarify farmers' attitudes toward protection as bigger farmers were both increasingly unfriendly (agri-specialists) and progressively thoughtful (refined man farmers) to preservation than farmers as a rule.

Social impact appraisal and sustainable agriculture

Social impact evaluation can be characterized as the way toward surveying or assessing the social results that are probably going to follow from explicit strategy activities or undertaking development, especially with regards to proper national, state, or commonplace ecological approach enactment (Vanclay, 2003; Burdge, 2004). It incorporates all social and cultural outcomes to human populaces of any open or private activities that modify the manners by which individuals live, work, play, identify with each other, sort out to address their issues, and by and large adapt as citizenry (Momtaz, 2005). Cultural impacts include changes to norms, qualities, and convictions of people that manage and justify their cognizance of themselves and their general public (Burdge and Vanclay, 1995).

Some have made a decent attempt to characterize social impact appraisal as a procedure. For instance Vanclay, (2002) accepts that social impact appraisal is the way toward dissecting (anticipating, assessing, and reflecting) and dealing with the proposed and unintended results on the human condition of arranged intercessions (strategies, projects, plans, and extends) and any social change

process conjured by those mediations to achieve an increasingly sustainable and even-handed biophysical and human condition. Social impact evaluation is a larger structure that envelops every single human impact including tasteful (scene, development, financial and monetary, sexual orientation, wellbeing, indigenous rights, framework, institutional), political (human rights, administration, democratization, and so forth.), destitution related, mental, and asset issues (access and responsibility for) (Vanclay, 2002).

The estimation of social impact evaluation in social development, inclusion making and arranging, open association, strife control, and sustainable development has been recognized (Barrow, 2000). With regards to the triple-main concern approach from sustainable development Vanclay, (2004), the social impact evaluation is of explicit significance in considering the social sustainability of agriculture. There is no uncertainty that the social impact appraisal is as significant, sometimes much more significant than the evaluations of biophysical and monetary elements of sustainable agriculture (Pisani and Sandham, 2006).

Social impact evaluation is important to give data on social sustainability of agricultural development. It makes agricultural division progressively comprehensive by including key partners. It makes agricultural ventures all the more socially stable by limiting or moderating unfriendly social impacts, expanding social advantages, and guaranteeing that the activities are in accordance with sustainable development (Becker, 2001). It can possibly give social criteria their legitimate spot close by financial and natural criteria in sustainable agriculture. Social impact evaluation is significant in sustainable agriculture development, since it helps organizers, agricultural development venture advocates, and the impacted populace and chiefs to comprehend and have the option to foresee the conceivable social results on human populaces and networks of proposed agricultural development exercises or arrangement changes.

The social impact evaluation needs to give a reasonable examination of possible social repercussions and rules for venture alternatives and suitable alleviation measures (Burdge, 2004). For sustainable agriculture development, maybe more than some other application, a social impact evaluation should consolidate with physical impact evaluation (e.g., Environmental impact appraisal),

financial examination, and other impact checks (Barrow, 2000). The need for such incorporation with other impact evaluation emerges on the grounds that agriculture is being sustainable just if the unpredictable elements are appropriate; if only one is lacking, creation vacillates may well fall flat (Karami, and Keshavarz, 2010).

Conclusion

Agricultural sustainability can never again disregard the human measurement and social elements which may be the middle components of agricultural development. Despite the fact that the agricultural and natural sciences are of significant criticalness, sociologists need to assume their job to break down the human measurement, which is fundamental to comprehension and accomplishing agricultural sustainability. Sustainable agriculture is a way of thinking dependent on human objective and comprehension of the long haul impact of our exercises on the earth and different species.

As expressed by (Karami, and Keshavarz, 2010), Sustainable Agriculture Sociology has added to our comprehension of agriculture sustainability by offering separate ways of thinking (ideal models) on the most proficient method to decipher and accomplish sustainability; investigating the association between farmers' attitudes and their sustainable strategies of farming. In clarifying and foreseeing sustainable farming practices, investigate the capability of dispersion and other elective selection models. Social impact evaluation shows what social changes are probably going to occur and what activities might be required to create supporting social foundations that are basic to advancing and keeping up sustainable agriculture.

Recommendations

The following are some of the recommendations made by the study:

1. Sociologists must analyze the human dimension, which is critical to comprehending and achieving agricultural sustainability. If sustainable agriculture is to be realized, sociology as a discipline must provide the necessary paradigm shift. That is a change from one perspective on agriculture to another.

2. Sociologists should provide the theoretical framework and empirical models to explain the relationship between sustainable agricultural attitudes and behaviours by investigating the relationship between farmers' attitudes and their sustainable farming practices. Policymakers, development agents, and researchers will use these frameworks to design and implement sustainable agriculture.
3. Women's actions, from local to global policy-making arenas, are a driving force for agricultural sustainability. Sociologists must look into how women can help advance sustainable agriculture and how to make women's contributions visible.
4. To achieve agricultural sustainability, a social impact assessment is required. It will allow policymakers, development agents, and researchers to forecast what social changes are likely to occur and what actions may be necessary to establish supportive social institutions that are critical for promoting and sustaining sustainable agriculture.

References

- Agricultural Sustainability Institute (2019). What is sustainable agriculture? asi.ucdavis.edu.
- Altieri, Miguel A. (1995) *Agroecology: The science of sustainable agriculture*. West view Press, Boulder, CO.
- Barbier E. (1987). The concept of sustainable economic development. *Environ Conserv* 14:101-110
- Barrow, C.J. (2000). *Social impact assessment: an introduction*. Arnold, London
- Becker, H.A. (2001). Social impact assessment. *Eur J Oper Res* 128:311–321
- Beedell, J. and Rehman, T. (2000). Explaining farmers' conservation behaviour: why do farmers behave the way they do? *J Environ Manage* 57:165–176
- Bergevoet, R.H.M., Ondersteijn, C.J.M., Saatkamp, H.W., Woerkum, C.M.J. and Huirne, R.B.M. (2004). Entrepreneurial behavior of Dutch dairy farmers under a milk quota system: goals, objectives, and attitudes. *Agric Syst* 80:1–21
- Burdge R. J. and Vanclay, F. (1995). Conceptualising social impacts. *Environmental Impact Assessment Review*, 22 (2002) 183–211.
- Burdge, R.J. (2004). *A community guide to social impact assessment*, 3rd edn. Social Ecology, Middleton
- Buttel, F. H. (1993). The sociology of agricultural sustainability: some observations on the future of sustainable agriculture. *Agric. Ecosyst. Environ* 46:175–186
- Clark, H.A.J. (1989). Conservation advice and investment on farms: a study in three English counties. Ph.D. dissertation, University of East Anglia, Norwich, East Anglia

- Committee on Agricultural Education in Secondary Schools (CAESS) (1988), (*Understanding agriculture*. National Academy Press, Washington, DC
- De Groot, W.T. (1992). Environmental Science theory: concepts and methods in a one-world problem-oriented paradigm. Ph.D. dissertation, University of Leyden, Elsevier, Amsterdam
- Dimara, E. and Skuras, D. (1999). Importance and need for rural development instruments under the CAP: a survey of farmers' attitudes in marginal areas of Greece. *J Agric Econ* 50 (2):304–315
- Gafsi M, Legagneux B, Nguyen G, Robin P (2006). Towards sustainable farming systems: effectiveness and deficiency of the French procedure of sustainable agriculture. *Agric Syst* 90:226-242
- Gasson, R. (1973). The goals and values of farmers. *J Agric Econ* 24:521–542
- Gold, M. (2009). What is Sustainable Agriculture? United States Department of Agriculture, Alternative Farming Systems Information Center.
- Grunwald, A. (2004). *Conflict and conflict-solving as chances to make the concept of sustainable development work*. In: Wilderer PA, Schröder ED, Kopp H (eds) Global sustainability: the impact of local cultures, Wiley-VCH, Germany
- Karami, E. and Keshavarz, M. (2010). Sociology, Organic Farming, Climate Change and Soil Science, *Sustainable Agriculture Reviews* 3
- Karami, E. and Mansoorabadi, A. (2008). Sustainable agriculture attitudes and behaviours: a gender analysis of Iranian farmers. *Environ Dev Sustain* 10:883–898
- Lélé, S.M. (1991). Sustainable development: A critical review. *ScienceDirect*. Volume Issue 6, Pages 607-621
- Lemon, M. and Park, J. (1993). Elicitation of farming agendas in a complex environment. *J. Rural Study* 9:405–410
- MacDonald, D. (1984). *A questionnaire survey of farmer's opinions and actions towards wildlife on farmland*. In: Jenkins D (ed) Agriculture and the environment-Symposium No 13. Institute of Terrestrial Ecology, Merlewood, Cumbria
- Momtaz, S. (2005). Institutionalizing social impact assessment in Bangladesh resource management: limitations and opportunities. *Environ Impact Assess Rev* 25(1):33-45
- Newby, H., Bell, C., Sanders, P., and Rose, D. (1977). Farmers' attitudes to conservation. *Countryside Recreation Rev* 2:23–30
- Pannell, D.J, and Schilizzi, S. (1999) Sustainable agriculture: a matter of ecology, equity, economic efficiency or expedience? *J Sustain Agric* 13(4):57–66
- PIEDA plc. (1993). Assessment of Conservation Advice to Farmers. London: Department of the Environment
- Pisani, J. A. D. and Sandham, L.A. (2006). Assessing the performance of SIA in the EIA context: a case study of South Africa. *Environ Impact Assess Rev* 26:707–724
- Potter, C. (1986). Processes of countryside change in lowland England. *J Rural Study* 2:187–195

- Rahman, M.Z., Mikuni, H., and Rahman, M.M. (1999). Towards sustainable farming development: the attitude of farmers in a selected area of Shimane Prefecture, *Japan. J Sustain Agric* 14(4):19–33
- Rasul, G. and Thapa, G.B. (2003) Sustainability analysis of ecological and conventional agricultural systems in Bangladesh. *World Dev* 31(10):1721–1741
- Roling, N. (1997). The soft side of land: socio-economic sustainability of land use systems. *ITCJ* 3(4):248–262
- Speeding, C.R.W. (1996). *Agriculture and the citizen*. Chapman & Hall, London
- Vanclay, F. (2002). Conceptualising social impacts. *Environ Imp Assess Rev.* 22(3):183– 211
- Vanclay, F. (2003). International principles for social impact assessment. *Imp Assess Proj Apprais* 21(1):5–11
- Vanclay, F. (2004). The triple bottom line and impact assessment: how do TBL, EIA, SIA, SEA and EMS relate to each other? *J Environ Assess Policy Manage* 6(3):265–288
- Wikipedia, the free Encyclopaedia, (2019)
- Yunlong, C, and Smith B (1994) Sustainability in agriculture: a general review. *Agric. Ecosyst Environ* 49:299–307