

# Opposition to Genetic Modification in Agriculture: Green Movements Motivations

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## ABSTRACT

World population is estimated by 2050 to reach 9.7 billion with large proportion concentrated in the developing countries. This increase in population will result in high demand for food which can be achieved through improved breeding of crops coupled with the adoption of genetic modification in Agriculture. However, great opposition in several countries advocated by Green Movement impedes the acceptance and adoption of genetically modified foods. This opposition is backed by environmental, political, economic and psychological motivations. Identifying the bases of these motivations will go a long way to boost the acceptance and adoption of genetic modification in Agriculture.

**Keywords:** Green movement; Psychological; Genetic modification; Motivation

## INTRODUCTION

Opposition to Genetically Modified Organisms (GMO, also refer as GM) especially crops has been a major drawback towards its progress over the years and has arguably resulted in catastrophic effects on numerous lives in developing countries [1]. These oppositions stem from Green Movement, a collective name given to organizations with social and political philosophies that share priorities in environmental sustainability and biodiversity conservation. These include Friends of the Earth, Greenpeace, The Organic Consumers Association and Union of Concerned Scientists. Several reasons for GM opposition have been identified and these falls broadly into the categories of environmentalism, ecopolitical and psychological motivations [2-5]. Understanding the bases for this opposition is imperative if future progress in GM crop development is to be made. This article will explore the reasons for GM opposition by examining each motivation.

## ENVIRONMENTALISM

First of all, the possibility of spread of transgene from GM crops into wild relatives which could have a deleterious impact on the environment is one of the claims by Green Movements [6]. This speculation involves the escape of transgene and introgression into organic crop field or related and wild species resulting in "genetic pollution". The effect of transgene escape is uncontrolled and may result in an unforeseeable effect which cannot be recalled in wild

populations once cross-bred, thus a threat to global food chain. A recent study claimed that nearly 400 contaminations have been recorded since the introduction of GM crops [7]. However, these records have not been scientifically proven. Besides, most GM crops that were considered to contaminate the environment were based on breach of international law such as labelling regulations, illegal planting of GM and the occurrence of unapproved GM traits or high levels of approved GM traits above applicable threshold. This suggests that claims of contaminations are unsubstantiated and involve illegal activities rather than offering scientific evidence.

Furthermore, Green Movements argued that consumption of GM crops could potentially have a harmful effect on human health and claimed that there is insufficient independent research to justify the long-term safety of GMO consumption. A recent campaign by Green peace claimed that BT eggplant poses health risks which led to the ban of this crop in Philippines [8]. Most of these claims are backed by conclusions drawn from bias or fabricated experiments and lack of severe facts or scientific evidence. Over more than 20 years since GMs introduction there have been no health issues reported [9-11]. Similarly, they pointed out that cultivation of GM crops has led to increased pesticide use resulting in "superweed" development and thus unsafe for the environment. Interestingly, the emergence of superweed is due to inappropriate agricultural practices and natural selection which has been in existence since the introduction of pesticides and thus has nothing to do with GM. Despite these grievances based on emotive health and

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environmental concerns, it cannot explain the immense GM adoption and improvement in farmers productivity as well as the voluminous studies that has elucidated unidentifiable health and environmental risk [9,11-13]. In the meantime, they have failed to antagonise the environmental cost of meat production donor and corporate interest.

## ECOPOLITICAL AND PSYCHOLOGICAL MOTIVATION

The Green Movement opposition to GM crops can be viewed wider than just the science. The patent of GM seeds and control of international seed industry by multinational seed company, Monsanto, [14,15] and its previous activities-agent orange production during the Vietnam war [16] are all called into question. This suggests that mistrust in multi-billion seed industries and political institutions as a means of capitalism is a driving force for this opposition and not just related to critiquing the science. Such a view was expressed by Jacob Needleman, an American philosopher, who wrote that “Once the hope of mankind, modern science has now become the object of such mistrust and disappointment that it will probably never again speak with its old authority” [17], thus environmental issues and political interest are coupled with trust in institutions [18]. Anti-GM advocates cite that GM crop adoption by farmers may promote neoliberalism and hinder local economic development-since multi-billion seed companies with capitalism focus will controls international seed (GM) trade [19,20]. Similarly, opposition by most developed countries could be viewed as avoidance of US ‘food imperialism’ characterized by economic-slavery, as most GM multi-billion seed companies are situated and regulated by US government [21]. Intriguingly, this can be attributed to an anti-capitalist movement which disbelieves

the priorities and direction of research and the monopolization of global agricultural food production. However, the connection of this argument with GMOs is not totally clear.

In India, Vandana Shiva, Greenpeace advisor, cited that 284,000 Indian farmers have committed suicide since 1995 due to incurred debt in purchasing expensive Monsanto Bt cotton seeds which caused massive failure and huge economic losses to local farmers and referred these seeds as “GM genocide” [5,19,22-24]. Despite this claim, 90% of Indian cotton farmers have adopted these seeds since approval and those farmers’ suicides claimed by Shiva were due to India economic regression and agricultural policies which reduced government support to local farmers. This instigated private loan acquisition with higher interest rate resulting in huge debts of cotton farmers [5,23]. Furthermore, this claim appears to be backed by techno- ethical concerns which perceive GMO as “unnatural”. This ideology of Green Movements is an intuitive sense of teleological intentional and disgust [4], “motivated reasoning” (Figure 1) which is financed largely by organic or “natural” food companies that benefit from these oppositions. Such motivated reasoning “refers to the discounting of information or evidence that challenges one’s prior beliefs accompanied by uncritical acceptance of anything that is attitude-consonant” [25]. This reasoning is common with scientific and political matters where individuals have little motivation to exert effort to consider all the arguments presented [26]. Disgust portrayed by Green Movement rouses the public to convict GMO and biotech companies as immoral [4].

Romanticism and motivated reasoning influence the intuition of Green Movement which have negative impact on their perception and presentation of GMO. Essentialism is an adaptive cognitive predisposition which affects scientifically well- known biological understanding and affect people’s understanding of GMO as Bt

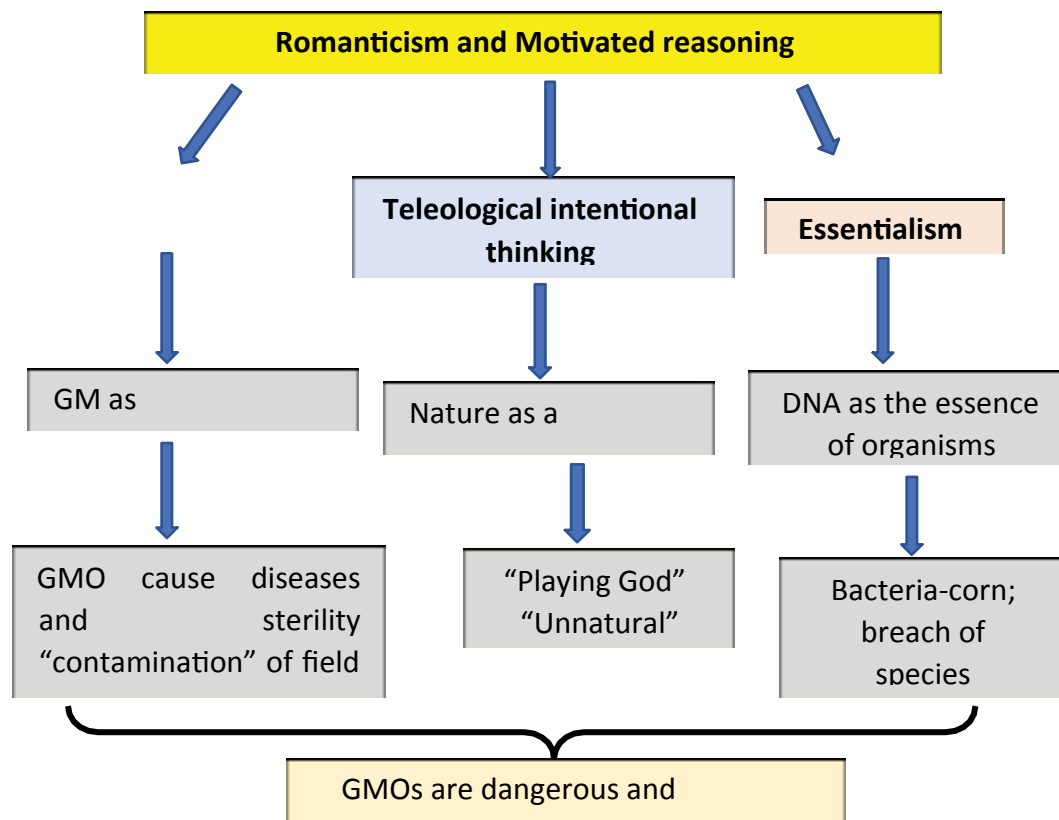


Figure 1: Psychological motivation of GM opposition by green movement.

corn is assumed to carry the essence of bacteria, thus affecting its acceptance and influencing opposition. Teleological and intentional intuitions are based on one's beliefs which considers GMO as "unnatural" and perceived as "Frankenfood" that will result in horrible danger to the environment. Disgust affect people's risk assessment of GMO of which Green Movements flood public with fabricated images such as apple with a syringe which imply that GMO are toxic and will "contaminate" the environment. Modified from Blancke et al. [4]

## CONCLUSION

GM opposition is a threat to global food security regardless of the numerous studies that have assessed the economic and unidentifiable environmental and health risks. This opposition by Green Movement is becoming alarming and their position remains static. Besides, this opposition is based on romanticism, emotion and intuition rather than empirical scientific evidences which are impossible to amend no matter huge scientific facts. Public education based on reliable scientific studies is necessary in order to nullify the effect of these oppositions and promote the adoption of GMO, thus ensuring global food security.

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