

GLOBAL HUMAN SECURITY THEORY

RECONSTRUCTION OF THE GLOBAL HUMAN SECURITY MATHEMATICAL PROBLEM

**Prepared by Salim Maloof
September 25, 2026**

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GLOBAL HUMAN SECURITY THEORY

GENERAL NOTE

Reconstruction of the Global Human Security Mathematical Problem September 25, 2026

I. Purpose of This Document

The purpose of this document is to recover, clarify, and mathematically reconstruct the **Original 2005 Theory of the Global Human Security Problem** developed by **Salim Maloof** between 2002 and 2005 and presented on May 31, 2005, under the title *The Global Human Security Problem: Mathematical Derivation*.

The reconstruction seeks to make the concepts, variables, relationships, graphical representation, and mathematical reasoning of the original theory sufficiently clear that they can be examined, challenged, and potentially developed into a mathematically testable model.

The 2026 reconstruction does not replace the original theory. It distinguishes the mathematical construct presented in 2005 from mathematical formulations introduced subsequently to clarify or further develop it.

II. Note to Readers

The Global Human Security Problem involves a very large number of variables and continuous changes in the conditions affecting human existence.

The Original 2005 Theory therefore did not attempt to derive a complete analytical solution for the entire function.

The theory was expressed in general form as:

$$\text{GHS} = \mathbf{f}(\mathbf{x})$$

This means that Global Human Security is represented as a function of the variables affecting the human system.

The original theory also presented a **graphical solution** to represent the changing condition of Global Human Security through time.

The absence of a complete analytical solution does not mean that the problem was not formulated mathematically. The Original 2005 Theory established a mathematical construct and a graphical representation; what had not yet been established was a complete analytical formulation of the relationships among all of its variables.

The purpose of the 2026 reconstruction is therefore to make those relationships sufficiently explicit to permit further mathematical examination and, where possible, testing.

III. Takeaway from the Theory

One of the central ideas arising from the Global Human Security Problem is that changes produced by human beings do not necessarily have a single consequence for human security.

Human beings alter Matter in order to improve their conditions of existence. Such changes may constitute **Social Improvement (SI)**.

However, the same human capacity to alter Matter may also produce **Social Destruction (SD)**, crises, conflicts, and other conditions that can adversely affect the continuation of human existence.

Therefore:

An increase in Social Improvement does not necessarily mean an increase in Global Human Security.

In mathematical form:

$\Delta SI > 0$ does not necessarily mean $\Delta GHS > 0$.

Here:

- ΔSI means a change or increase in Social Improvement.

- Δ GHS means a change in Global Human Security.
- The statement means that an increase in Social Improvement cannot automatically be assumed to increase GHS.

The effect of Social Improvement must therefore be considered within the condition of the entire human system.

An action may produce an improvement according to ordinary social, economic, political, technological, or other criteria while nevertheless reducing the capacity of the human system to sustain human existence.

The central question is therefore:

Can the processes through which humanity seeks to improve its condition eventually produce conditions that diminish the capacity of the human system to sustain human existence?

This question is one of the principal issues that the mathematical construct seeks to examine.

IV. Mathematical Issues Requiring Further Development

The Original 2005 Theory establishes a mathematical construct and a graphical representation, but several aspects require further mathematical specification if the theory is to be developed into a fully testable model.

1. The variables are not yet placed on a common mathematical scale

The original construct contains variables such as water, food, air, Material of Terrestrial Origin, human physical existence, human behavior, Social Improvement, Social Destruction, Man-Made Disasters, and Recurrent Natural Disasters.

The mathematical relationship among quantities of such different kinds requires further definition, normalization, or another mathematically defensible method of combination.

In simple terms, the question is:

How can quantities or conditions of very different kinds be brought together mathematically without creating a meaningless calculation?

2. The functional form of $f(x)$ remains to be established

The original theory expresses Global Human Security as:

$$\text{GHS} = f(x)$$

This means that GHS depends on a collection of variables represented by x .

However, the original theory does not establish the complete mathematical form of $f(x)$.

The mathematical task is therefore to determine what type of function can represent the relationships among the variables while remaining faithful to the original construct.

3. Crises and Conflicts as a Function of Human Social Improvement

The Original 2005 Theory proposes:

$$\text{CC}_{\text{man}} = f(\text{SI}_{\text{man}})$$

This represents Crises and Conflicts involving human beings as a function of Social Improvement produced through human activity.

This relationship does not mean that Social Improvement is inherently destructive or undesirable. Humans seek Social Improvement because they seek to improve their conditions and increase their well-being. In doing so, however, they alter existing conditions, relationships, and the order in which human and material systems exist.

Human beings do not possess a perfectly ordered system comparable to the ordered relations found in mathematics. Consequently, an action intended to improve conditions for one person, group, or society may alter conditions for others and generate new forms of disorder. The process can therefore be represented conceptually as:

**Existing condition → Human action for improvement → Change → New disorder
→ Crises and Conflicts → Attempt to establish a new order**

The process may repeat continuously. In this sense, Crises and Conflicts are not necessarily the opposite of Social Improvement; they may arise from the human process of attempting to produce improvement within a system in which changes interact with one another.

The Original 2005 Theory also proposes:

$$\text{HRE} = f(\text{CC_man}) = f(\text{man})$$

This expresses the relationship between human Crises and Conflicts and the process leading toward Human Race Extinction.

The mathematical task for the reconstruction is therefore not to question whether these relationships belong to the theory, but to determine how they can be mathematically specified, measured, and tested: their functional form, magnitude, time dependence, interactions with the other variables, and their effect on the trajectory of GHS.

4. Point A requires precise mathematical interpretation

Point A is identified in the original graphical construct as the actual-time point.

The original derivation also establishes a condition at Point A involving Human Race Extinction:

$$\text{HRE} = f(x)$$

In the original derivation, this leads to:

$$\text{GHS_man} = 0$$

Point A therefore represents the actual-time position of the human system in the graphical construct. Human Race Extinction is a terminal condition that may occur at Point A if the conditions affecting the human system produce the extinction of the human race at that actual time.

Thus, Point A and Human Race Extinction should not be treated as identical concepts:

Point A = actual-time position

HRE = terminal human condition

If Human Race Extinction occurs at Point A, then:

$$\text{GHS_man} = 0$$

The Original 2005 Theory therefore establishes an important mathematical and graphical relationship between Point A, Human Race Extinction, and the resulting condition in which GHS reaches zero, without establishing that humanity has necessarily reached extinction at every actual-time Point A.

What remains for the 2026 mathematical reconstruction is to determine more precisely the mathematical conditions and trajectory through which the system reaches Point A, including the functional relationships among the variables and the time-dependent changes that may lead to the Human Race Extinction condition.

The original theory therefore establishes an important mathematical and graphical structure without claiming that the exact time at which Human Race Extinction occurs has been analytically calculated.

V. Dynamic Character of the Global Human Security Problem

The Global Human Security Problem can be understood as a dynamic system in which Matter, human existence, human behavior, social processes, disasters, crises, and conflicts change over time and interact with one another.

The principal variables identified in the Original 2005 Theory include:

- Matter and its changing state;
- water, food, and air;
- Material of Terrestrial Origin;
- the physical human body;
- human behavior;
- Social Improvement (SI);
- Social Destruction (SD);
- Man-Made Disasters (MMD);
- Recurrent Natural Disasters (RND);
- Crises and Conflicts (CC); and
- Human Race Extinction (HRE).

These variables should not be understood as a simple linear sequence.

Their relationships may involve interaction, feedback, and changes in effect over time.

Global Human Security represents the resulting capacity of the human system to sustain human existence.

The relationship can be represented simply as:

$$\mathbf{GHS(t) = F(x(t))}$$

This means:

GHS at a particular time depends on the condition of the relevant variables at that time.

The mathematical task is to determine the functional relationships connecting these variables and their effects on GHS.

VI. Concepts Introduced in the 2026 Reconstruction

The Original 2005 Theory is preserved as the foundation of this reconstruction.

The 2026 work introduces additional mathematical notation only where it helps clarify the dynamic character of the original construct.

The original theory expresses the relationship as:

$$\mathbf{GHS = f(x)}$$

The 2026 reconstruction can express the same general idea dynamically as:

$$\mathbf{GHS(t) = F(x(t))}$$

The difference is primarily one of notation.

The first expression describes the general mathematical relationship.

The second makes explicit that the variables and their relationships can change with time.

In simple terms:

The condition of Global Human Security at one moment may not be the same as its condition at another moment because the variables themselves are changing.

Further developments — including differential equations, normalization methods, feedback equations, probability models, extinction-risk functions, or critical-threshold models — should be treated as **future mathematical extensions** unless and until they are derived and justified.

No such extension should be presented as part of the Original 2005 Theory.

VII. Study Note

When studying this reconstruction, readers should keep two distinct layers in view.

THE 2005 THEORY

The Original 2005 Theory establishes the Global Human Security Problem through a mathematical construct involving:

- water, food, and air;
- Material of Terrestrial Origin;
- the physical human body;
- human behavior;
- Social Improvement;
- Social Destruction;
- Man-Made Disasters; and
- Recurrent Natural Disasters.

The general mathematical expression is:

$$\mathbf{GHS} = \mathbf{f(x)}$$

The theory also establishes the graphical development through:

Point 1 → Point 2 → Point 3 = Point A

Point A represents actual time in the graphical construct.

The original theory then considers the Human Race Extinction condition and the resulting condition in which GHS reaches zero.

THE 2026 MATHEMATICAL RECONSTRUCTION

The 2026 reconstruction seeks to express the original dynamic relationships more explicitly through:

- time-dependent variables;
- mathematical functions;
- possible differential relationships;
- interaction and feedback;
- normalization or scaling where mathematically necessary; and
- other mathematical tools required to make the original propositions testable.

The second layer must not be confused with what was actually presented in 2005.

Its purpose is to **clarify, formalize, and test the original construct**, not to rewrite history or silently replace the original theory with a different one.

VIII. Annex 1 — Reconstruction of the 2005 Theory

The following annex presents a detailed reconstruction of the Original 2005 Theory of the Global Human Security Problem.

It follows the original sequence of concepts, variables, mathematical relationships, graphical representation, Points 1, 2, and 3/A, and the Human Race Extinction condition.

Where the 2026 reconstruction introduces mathematical notation or interpretation that was not explicitly established in the 2005 presentation, it is identified as such.

The objective is to allow the original theory to be read in a clearer mathematical form while preserving its original conceptual structure.

IX. Annex 2 — Possible Mathematical Extensions of the 2005 Theory

ANNEX 1: Reconstruction of the Global Human Security Mathematical Problem

Salim Maloof — Original 2005 Theory and Mathematical Reconstruction

Original presentation: May 31, 2005

Title: *The Global Human Security Problem: Mathematical Derivation*

Prepared for study and further development

PART I — THE ORIGINAL 2005 THEORY

1. Purpose of the Theory

The purpose of the 2005 presentation was to examine the problem of Global Human Security (GHS) from a mathematical perspective.

The fundamental question was whether the security and survival of humanity could be represented through a mathematical construct involving the physical world, human beings, human behavior, Social Improvement, Social Destruction, Crises and Conflicts, and disasters.

The theory begins with the recognition that human beings depend upon Matter for their existence, while human beings simultaneously modify Matter through their activity.

Those modifications may contribute to conditions that sustain human existence or to conditions that threaten it.

The central concern of the theory is therefore the capacity of the human system to sustain human existence.

2. Matter

Matter is a fundamental concept in the theory.

Human beings depend upon the material world for survival and for satisfying material and earthly needs.

Human beings also modify Matter.

These modifications can be divided conceptually into:

Social Improvement (SI)

and

Social Destruction (SD).

The central idea is therefore:

Human beings interact with Matter.

Human activity changes Matter.

Changes to Matter affect human existence.

Human beings continuously modify the conditions in which human existence takes place.

These modifications include processes identified in the original theory as Social Improvement and Social Destruction.

The important question is not whether every modification is inherently beneficial or destructive, but how changes produced through human activity affect the capacity of the human system to sustain human existence.

3. The Variable x

The original presentation uses:

$$\text{GHS} = f(x)$$

The variable x represents the broad collection of factors involved in the Global Human Security Problem.

The original presentation does not reduce x to a single measurable physical quantity. It encompasses the various material, human, behavioral, social, and disaster-related elements identified in the theory.

For purposes of clarification, the changing nature of these variables may be recognized in the 2026 reconstruction as:

$$x = x(t)$$

This notation is a 2026 clarification of the dynamic character of the original construct. It does not claim that the 2005 presentation defined x as a formal time-dependent vector.

The important point is that Global Human Security is represented as a function of the changing conditions of the larger human-Matter system.

4. $j(x)$

The original presentation identifies:

$$\mathbf{j(x)} = \mathbf{water} + \mathbf{food} + \mathbf{air}$$

These represent fundamental material requirements for human existence.

In the original construct, $\mathbf{j(x)}$ forms part of the material foundation upon which human existence depends.

5. Material of Terrestrial Origin

The theory also introduces:

MTO = Material of Terrestrial Origin

MTO represents material originating from the terrestrial environment and forming part of the material conditions associated with human existence.

Together, $\mathbf{j(x)}$ and **MTO** identify part of the physical and material foundation of the Global Human Security Problem.

6. Physical Body of Man

The original equation introduces:

PB_man = Physical Body of Man

and uses:

Σ PB_man

to represent the physical human component of the construct.

The physical body of a human being is part of Matter.

It is therefore important to distinguish the physical human body from human behavior.

For the purposes of later mathematical investigation, population may be introduced as an additional measurable variable where appropriate. However:

Population $\neq$ Physical Body of Man

Population should therefore not automatically be substituted for the original **PB_man** term.

7. Human Behavior

The theory introduces:

HB_man = Human Behavior

and:

Σ HB_man

Human beings do not merely exist within Matter. They act upon Matter and upon the conditions governing human existence.

Human behavior therefore constitutes an active component of the Global Human Security Problem.

Human behavior may contribute to Social Improvement, Social Destruction, Crises and Conflicts, and other consequences of human activity.

Human behavior should not itself be classified simply as positive or negative. Its significance depends upon its consequences within the larger system.

8. Social Improvement

The theory introduces:

SI_man = Social Improvement

Social Improvement represents changes produced through human activity that are intended to improve human conditions.

Such changes may involve knowledge, technology, infrastructure, medicine, communication, organization, material conditions, institutions, and other aspects of human life.

An important distinction must be maintained:

Social Improvement is not assumed to produce an increase in GHS in every circumstance.

A change may be regarded as an improvement from the perspective of human objectives while simultaneously producing consequences elsewhere in the system that may diminish Global Human Security.

Thus:

$\Delta SI > 0$ does not necessarily imply $\Delta GHS > 0$.

The effect of Social Improvement must be examined within the state of the larger system.

9. Social Destruction

The theory also introduces:

SD_man = Social Destruction

Social Destruction represents destructive changes produced through human activity.

Social Improvement and Social Destruction are distinct processes within the human system.

They should not be reduced to a single quantity such as:

SI - SD

because an increase in Social Improvement does not automatically cancel an increase in Social Destruction, nor does their numerical difference by itself determine the effect on Global Human Security.

The central issue is the effect of these processes, individually and through their interactions, on the capacity of the human system to sustain human existence.

10. The Original Global Human Security Equation

The central mathematical expression of the 2005 presentation is:

$$\mathbf{GHS} = \mathbf{f(x)}$$

The original presentation further expresses the construct through the following expanded form:

$$\mathbf{GHS} = \mathbf{j(x)} + \mathbf{MTO} + \mathbf{\Sigma PB_man} + \mathbf{\Sigma HB_man} + \mathbf{SI_man} + \mathbf{SD_man} + \mathbf{MMD} + \mathbf{RND}$$

where:

j(x) = water, food, and air

MTO = Material of Terrestrial Origin

PB_man = Physical Body of Man

HB_man = Human Behavior

SI_man = Social Improvement

SD_man = Social Destruction

MMD = Man-Made Disasters

RND = Recurrent Natural Disasters

The plus signs in this original expression should not be interpreted as meaning that every term contributes positively to Global Human Security.

They indicate that the identified components form part of the mathematical construct.

The direction and consequences of each component must be understood from the relationships within the theory.

The equation should therefore be understood as the conceptual mathematical framework presented in 2005, rather than as a completed numerical equation in which all variables have already been expressed in common units or assigned empirically established weights.

PART II — DISASTERS, CRISES AND CONFLICTS

11. Man-Made Disasters

The theory introduces:

MMD = Man-Made Disasters

These represent destructive events arising from human activity.

MMD is one of the components identified in the original Global Human Security construct.

The precise mathematical relationship between MMD and the other variables was not fully specified in the 2005 presentation.

The 2026 reconstruction therefore retains MMD as an original variable while leaving its detailed mathematical formulation for further investigation.

12. Recurrent Natural Disasters

The theory also introduces:

RND = Recurrent Natural Disasters

These represent naturally occurring destructive events and are distinguished from Man-Made Disasters.

The consequences of a natural disaster for human beings may depend upon the condition of the human system at the time of the event.

For example, the consequences may depend upon population, resources, environmental conditions, infrastructure, preparedness, and human behavior.

The precise mathematical relationship between RND and the other variables remains a subject for further mathematical development.

13. Crises and Conflicts as a Function of Human Social Improvement

The Original 2005 Theory proposes:

$$\text{CC}_{\text{man}} = f(\text{SI}_{\text{man}})$$

This represents Crises and Conflicts involving human beings as a function of Social Improvement produced through human activity.

This relationship does not mean that Social Improvement is inherently destructive or undesirable.

Humans seek Social Improvement because they seek to improve their conditions and increase their well-being.

In doing so, however, they alter existing conditions, relationships, and the order in which human and material systems exist.

Human beings do not possess a perfectly ordered system comparable to the ordered relations found in mathematics. Consequently, an action intended to improve conditions for one person, group, or society may alter conditions for others and generate new forms of disorder.

The process can therefore be represented conceptually as:

Existing condition → Human action for improvement → Change → New disorder → Crises and Conflicts → Attempt to establish a new order

The process may repeat continuously.

The relationship:

$$\text{CC}_{\text{man}} = f(\text{SI}_{\text{man}})$$

therefore identifies an important proposition of the original theory: the human effort to improve conditions can itself generate changes and interactions that contribute to Crises and Conflicts.

The original presentation also proposes:

$$\text{HRE} = f(\text{CC}_{\text{man}}) = f(\text{man})$$

This expresses the relationship between human Crises and Conflicts and the process leading toward Human Race Extinction.

The mathematical task of the 2026 reconstruction is to determine how these relationships might eventually be specified, measured, and tested without replacing the relationships themselves with assumptions that were not part of the original theory.

PART III — THE DYNAMIC CHARACTER OF THE THEORY

14. The Dynamic Character of the Variables

The variables of the Global Human Security Problem are dynamic variables.

At any given point in time, their states constitute the conditions underlying the capacity to sustain human existence; their interactions and changes over time constitute the processes through which that capacity is maintained, increased, diminished, or potentially exhausted.

The principal variables identified in the Original 2005 Theory include:

- Matter and its changing state;
- water, food, and air;
- Material of Terrestrial Origin;
- the physical human body;
- human behavior;
- Social Improvement;
- Social Destruction;
- Man-Made Disasters;
- Recurrent Natural Disasters;
- Crises and Conflicts; and
- Human Race Extinction.

These variables should not be understood as a simple linear sequence.

Their relationships may involve interaction, feedback, and changes in effect over time.

Global Human Security represents the resulting capacity of the human system to sustain human existence.

For the 2026 reconstruction, the dynamic character of the original relationship may be expressed as:

$$\mathbf{GHS(t) = F[x(t)]}$$

This means that GHS at a particular time depends upon the condition of the relevant variables at that time.

The precise mathematical relationships connecting those variables remain subjects for further investigation.

15. The Changing State of the Human-Matter System

For purposes of the 2026 reconstruction, the broad collection of variables represented by $\mathbf{x}$ may be understood as changing with time:

$$\mathbf{x} = \mathbf{x}(t)$$

Depending upon the mathematical model eventually developed, $\mathbf{x}(t)$ may contain variables representing Matter, the physical human body, Human Behavior, Social Improvement, Social Destruction, Crises and Conflicts, Man-Made Disasters, Recurrent Natural Disasters, and other relevant conditions.

This is a 2026 mathematical clarification and does not imply that the Original 2005 Theory used a formal state-vector notation.

16. Matter as a Dynamic Variable

Matter is dynamic.

The original theory recognizes that Matter changes naturally and that human beings also modify Matter.

For purposes of the reconstruction:

$$\mathbf{M} = \mathbf{M}(t)$$

This means that the state of Matter changes with time.

The precise mathematical law governing the changes in Matter is not established in the original theory.

It remains a subject for further mathematical development.

17. Human Population

For purposes of the 2026 reconstruction:

$$\mathbf{P}(t) = \text{human population at time } t$$

Population is an important variable because human beings are the subjects whose existence is to be sustained.

However, population is not the definition of Global Human Security.

Thus:

$$\text{GHS} \neq P(t) \times Q(t)$$

Population is one variable within the larger system represented by $x(t)$.

At the time at which Human Race Extinction occurs at Point A:

$$P(t_A) = 0$$

This provides a possible measurable expression of the terminal human condition, but it does not replace the original mathematical treatment of Point A.

18. Human Behavior

Define:

$$B(t) = \text{Human Behavior}$$

Human behavior is a dynamic component of the human system.

It can influence Social Improvement, Social Destruction, Crises and Conflicts, and other consequences of human activity.

Human behavior should not be divided in advance into simply “positive” and “negative” behavior because the consequences of behavior depend upon the system in which the behavior occurs.

Detailed mathematical functions describing these relationships remain subjects for further investigation.

PART IV — GLOBAL HUMAN SECURITY AS A DYNAMIC RELATIONSHIP

19. Global Human Security

The Original 2005 Theory establishes:

$$\text{GHS} = f(x)$$

For the 2026 reconstruction, because the variables represented by x may change with time, the relationship may be written:

$$\text{GHS}(t) = F[x(t)]$$

The purpose of this formulation is not to redefine GHS as a particular index.

It is to make explicit the dynamic character of the original idea that Global Human Security depends upon the changing condition of the larger human-Matter system.

GHS represents the **remaining capacity of the human system to sustain human existence**.

20. The Need for Measurement

The original variables are not automatically expressed in a common numerical scale.

Before they can be combined quantitatively, appropriate definitions, measurement procedures, scales, and normalization methods would have to be established.

This is a 2026 methodological problem.

The existence of this problem does not invalidate the original mathematical construct. It identifies work that remains necessary before the construct can become a fully operational quantitative model.

PART V — HUMAN RACE EXTINCTION AND POINT A

21. Human Race Extinction and Point A

The Original 2005 Theory introduces:

HRE = Human Race Extinction

and identifies Point A in the graphical representation of the theory.

Point A represents the actual-time position of the human system in the graphical construct. At any actual point in time, the condition of the human system may be affected by the combined effects of Matter, Human Behavior, Social Improvement, Social Destruction, Man-Made Disasters, Recurrent Natural Disasters, and other relevant variables.

Human Race Extinction is therefore a possible condition that may occur at Point A if the conditions affecting the human system produce the extinction of the human race in actual time.

The original presentation establishes, at the extinction condition:

$HRE = f(x)$

and:

$GHS_{man} = f(x) - HRE$

with:

$$\mathbf{GHS_man = 0}$$

Thus, Point A should not be understood as meaning that humanity has necessarily already become extinct. Rather, Point A identifies the actual-time position of the system, at which the human condition can be assessed. If the conditions at that actual time produce Human Race Extinction, then HRE occurs at Point A and the corresponding Global Human Security condition is:

$$\mathbf{GHS_man = 0}$$

The possibility that HRE may occur at any actual point in time is particularly relevant to catastrophic events, including a sufficiently destructive Man-Made Disaster or Recurrent Natural Disaster, such as a major meteor impact, whose effects could produce Human Race Extinction.

For purposes of the 2026 reconstruction, human population may be used as one measurable variable in examining such an extinction condition. At the point at which HRE actually occurs:

$$\mathbf{P(t_A) = 0}$$

This population condition applies to the occurrence of Human Race Extinction; it should not be interpreted as meaning that the population at every actual-time Point A is zero.

Here, GHS_man denotes the human-specific expression used in the original derivation at the Human Race Extinction condition; it should not be understood as a different definition of Global Human Security from the general expression $GHS = f(x)$.

22. Global Human Security at Point A

Point A represents the actual-time position of the human system. The Global Human Security condition at Point A therefore depends upon the state of the variables constituting the system at that time.

The original theory establishes the terminal condition associated with Human Race Extinction as:

$$\mathbf{HRE = f(x)}$$

and:

$$\mathbf{GHS_man = f(x) - HRE}$$

so that, when Human Race Extinction occurs:

$$\mathbf{GHS_man = 0}$$

Therefore:

$$\mathbf{HRE \rightarrow GHS = 0}$$

This means that, when Human Race Extinction occurs at the actual-time Point A, there are no remaining human beings whose existence can be sustained.

The condition:

$$\mathbf{GHS = 0}$$

is therefore a statement about the human system at the occurrence of Human Race Extinction.

It is not a statement that the physical universe, Earth, or Matter disappears.

Point A may represent the actual-time condition of humanity while humanity continues to exist. HRE represents the terminal condition that may occur at that point if the circumstances affecting the human system produce the extinction of the human race.

23. Matter Does Not End With Humanity

Human Race Extinction does not logically require the disappearance of Matter.

The physical world may continue to exist and change after human beings cease to exist.

Therefore:

$$\mathbf{HRE \neq Matter\ Extinction}$$

and:

$$\mathbf{GHS = 0}$$

does not imply:

$$\mathbf{Matter = 0}$$

or:

$$\mathbf{Earth = 0}$$

The distinction is essential.

After Human Race Extinction, the physical world may continue to change, but the Global Human Security Problem, as a problem concerning the sustaining of human existence, has reached its terminal condition.

The theory does not need to determine what happens to GHS after that condition because there are no humans remaining whose security or survival is being considered.

PART VI — THE GRAPHICAL DEVELOPMENT OF THE THEORY

24. Point 1, Point 2, Point 3 and Point A

The original graphical construct distinguishes:

Point 1 → Point 2 → Point 3 = Point A

Point 1 represents the condition in which there are no humans on Earth and Matter changes naturally.

The original presentation expresses this condition as:

$$\text{GHS} = 0 = \mathbf{j(x)} + \text{MTO}$$

At Point 1, **j(x)** and **MTO** are not zero in the physical sense. Water, food, air, and Material of Terrestrial Origin existed before humans. However, in relation to Global Human Security, they have no human-security meaning at Point 1 because there are no humans whose existence is being sustained.

Consequently, the Global Human Security condition is:

$$\text{GHS} = 0$$

Point 1 therefore represents the material condition of the Earth before human existence and establishes the initial human-security condition as zero.

Point 2 represents the emergence of human existence and the beginning of the changes associated with the **Physical Body of Man, Human Behavior, Social Improvement, and Social Destruction**. With the emergence of humans, the material conditions that existed before humanity become relevant to the problem of sustaining human existence.

Point 3 is identified as:

Point 3 = Point A

Point A represents the **actual-time position** in the graphical construct. It is therefore the point at which the condition of the human system is being considered at a particular time.

Point A does not, by itself, mean that **Human Race Extinction (HRE)** has already occurred. HRE is a terminal human condition that may occur at Point A if the conditions affecting the human system result in the extinction of humanity.

For example, a sufficiently destructive **Man-Made Disaster (MMD)** or **Recurrent Natural Disaster (RND)**, including a major meteor impact, could cause Human Race Extinction at the actual-time Point A.

The sequence is therefore:

Point 1 → Point 2 → Point 3 = Point A

It represents the development of the Global Human Security Problem from the **pre-human condition**, through the **emergence and continuation of human existence and activity**, to the **actual-time condition represented by Point A**.

The zero condition at Point 1 and the zero condition associated with Human Race Extinction are mathematically equal but conceptually distinct:

- **Point 1: $GHS = 0$** because human existence has not yet emerged.
- **HRE: $GHS_{man} = 0$** because human existence has ended.

Thus, the same numerical value, zero, represents two opposite boundaries of the human-security problem: **the condition before human existence and the condition after human existence has ceased**.

The original presentation writes the Point 1 relationship as **$GHS = 0 = j(x) + MTO$** . In the present reconstruction, this expression is preserved as part of the original 2005 construct. Its meaning is that **$j(x)$ and MTO, although physically present, have no human-security significance before human existence begins**; it should therefore be understood within the conceptual structure of the Global Human Security Problem rather than as an ordinary arithmetic equality stating that the physical material components themselves are zero.

25. The Condition From Point A Toward Infinity

The original presentation also considers the condition from Point A toward infinity.

Because Point A represents actual time, the trajectory beyond Point A represents the continuation of the system through future time. The condition of the human system may therefore continue to change after Point A.

If Human Race Extinction occurs at Point A, however, then the human component of the Global Human Security Problem reaches its terminal condition at that time.

If Human Race Extinction does not occur at Point A, the human system continues beyond Point A, and the trajectory may be examined as it develops through subsequent conditions.

Matter does not necessarily cease to exist or change after Human Race Extinction. The physical human body, as Matter, remains part of the physical world and may continue to change after death.

However, Human Behavior, Social Improvement, Social Destruction, and other processes requiring living human beings no longer continue as human processes after Human Race Extinction.

The theory therefore does not require a determination of what happens to Global Human Security after HRE. Once humanity has ceased to exist, the human problem has reached its terminal condition.

PART VII — THE DYNAMIC INTERACTION OF HUMAN ACTIVITY

26. Human Activity and Matter

Human beings depend upon Matter while simultaneously modifying Matter.

The resulting relationship is recursive:

Matter and Existing Conditions

↓

Human Interaction and Activity

↓

Changes Produced by Human Activity

↓

Changes in Human and Material Conditions

↓

Human Response and Further Activity

↓

Further Changes

The important feature is that the process is recursive rather than strictly linear.

Human beings respond to conditions they themselves have helped create, thereby producing further changes.

27. Social Destruction, Crises and Conflicts

Human activity can produce Social Destruction.

Social Destruction can contribute to Crises and Conflicts.

Crises and Conflicts can contribute to destructive events and conditions that reduce the capacity of the human system to sustain human existence.

A possible conceptual pathway is:

Human Activity → Social Destruction → Crises and Conflicts → Destructive Consequences → Reduced GHS → Changed Human Conditions → Further Human Activity

This should not be interpreted as a simple one-way causal chain.

It represents a possible feedback process within the theory.

28. Social Improvement and Its Consequences

Human activity may produce Social Improvement intended to improve human conditions.

A possible pathway is:

Human Activity → Social Improvement → Changed Conditions → Possible Increase in GHS

However, the relationship is not necessarily positive under all conditions.

Social Improvement may also alter existing relationships and conditions in ways that generate new disorder, Crises and Conflicts, or other consequences.

Therefore:

$\Delta SI > 0$ does not necessarily imply $\Delta GHS > 0$.

This is a central distinction in the reconstruction.

Social Improvement may contribute to human well-being while simultaneously producing changes elsewhere in the system that require further examination.

PART VIII — THE CRITICAL BALANCE

29. Interaction Between Social Improvement and Social Destruction

Social Improvement and Social Destruction are distinct processes.

The important question is not whether one can simply be subtracted from the other, but how each process, separately and jointly, affects the changing state of the human-Matter system.

The general dynamic relationship remains:

$$\text{GHS}(t) = F[x(t)]$$

The mathematical form of this relationship remains to be established.

30. Point A and the Terminal Human Condition

In the original theory, Point A represents the actual-time position of the human system.

The original graphical construct distinguishes:

Point 1 → Point 2 → Point 3 = Point A

and then considers the condition from Point A toward infinity.

Point A therefore represents the position of the system at actual time. It does not necessarily mean that Human Race Extinction has already occurred.

The terminal human condition is represented by Human Race Extinction:

$$\text{HRE} = f(x)$$

and, when HRE occurs:

$$\text{GHS}_{\text{man}} = f(x) - \text{HRE}$$

so that:

$$\text{GHS}_{\text{man}} = 0$$

Human Race Extinction may occur at Point A if the conditions affecting the human system produce extinction at that actual time. A sufficiently destructive Man-Made Disaster or Recurrent Natural Disaster could, in principle, produce such a condition.

Thus, Point A and HRE are related but are not identical concepts:

Point A = actual-time position

HRE = terminal human condition

When HRE occurs at Point A:

$$\text{GHS}_{\text{man}} = 0$$

The physical world does not thereby become zero. Matter may continue to exist and change after the extinction of humanity.

The precise mathematical trajectory determining the movement of the system toward or away from the terminal human condition remains a subject for further investigation.

PART IX — WHAT WAS ORIGINAL IN 2005?

31. Original Concepts and Relationships

The following concepts and relationships belong to the original framework presented in 2005:

- Global Human Security;
- Matter;
- $j(x)$;
- Material of Terrestrial Origin (MTO);
- Physical Body of Man (PB_man);
- Human Behavior (HB_man);
- Social Improvement (SI_man);
- Social Destruction (SD_man);
- Man-Made Disasters (MMD);
- Recurrent Natural Disasters (RND);
- Crises and Conflicts (CC_man);
- Human Race Extinction (HRE);
- Point A;
- **GHS = $f(x)$** ;
- the expanded GHS construct;
- **CC_man = $f(SI_man)$** ;
- **HRE = $f(CC_man) = f(man)$** ;
- the movement from Point 1 through Point 2 to Point 3 = Point A;
- the distinction between the condition before Point A and the condition from Point A toward infinity; and
- the graphical representation of the trajectory toward Point A.

These concepts and relationships should be attributed to the original 2005 work.

32. What Has Been Added or Clarified in 2026?

The 2026 reconstruction introduces mathematical clarification where necessary to make the original theory easier to examine.

These clarifications include:

- recognizing the variables as dynamic;
- writing $\mathbf{x} = \mathbf{x}(\mathbf{t})$;
- writing $\mathbf{GHS}(\mathbf{t}) = \mathbf{F}[\mathbf{x}(\mathbf{t})]$;
- distinguishing population from the original Physical Body of Man variable;
- distinguishing GHS from a population-based index;
- clarifying the terminal human condition at HRE;
- clarifying that **GHS = 0 does not mean Matter = 0**;
- clarifying the distinction between the original theory and mathematical developments that remain to be undertaken.

The following are **not** established equations of the original theory:

$$\mathbf{N_H} = \mathbf{SI} - \mathbf{SD}$$

$$\mathbf{GHS} = \mathbf{P} \times \mathbf{Q}$$

or:

$$\mathbf{dM/dt} = \mathbf{N} + \mathbf{SI} - \mathbf{SD}$$

These formulations should not be treated as part of the Original 2005 Theory.

The purpose of the 2026 reconstruction is therefore to make the original theory more mathematically explicit without replacing its conceptual structure with assumptions that were not established in 2005.

Detailed possible mathematical developments are presented separately in **Annex 2 — Possible Mathematical Extensions of the 2005 Theory**.

PART X — THE CENTRAL RELATIONSHIP OF THE THEORY

The original theory can be represented conceptually as a changing relationship among:

Matter → Human Existence → Human Activity → Social Improvement / Social Destruction → Crises and Conflicts → Global Human Security → Human Race Extinction

This should not be interpreted as a simple linear sequence.

Human beings modify the conditions in which they exist, and the resulting changes affect subsequent human activity.

The central mathematical expression remains:

$$\mathbf{GHS} = \mathbf{f}(\mathbf{x})$$

For purposes of the 2026 reconstruction:

$$\mathbf{GHS(t)} = \mathbf{F[x(t)]}$$

The original relationships include:

$$\mathbf{CC_man} = \mathbf{f(SI_man)}$$

and:

$$\mathbf{HRE} = \mathbf{f(CC_man)} = \mathbf{f(man)}$$

The terminal condition associated with Human Race Extinction, when it occurs at Point A, is:

$$\mathbf{GHS_man} = \mathbf{0}$$

Human Race Extinction represents the terminal human condition of the problem.

PART XI — THE CENTRAL QUESTION OF THE THEORY

The deepest question underlying the 2005 work can be expressed as:

Does increasing human capability to modify Matter necessarily increase Global Human Security, or can the same capability generate Social Destruction, Crises and Conflicts that diminish the capacity of the human system to sustain human existence?

The theory recognizes that human beings are both beneficiaries of and modifiers of the system upon which they depend.

Human beings modify Matter in pursuit of improvement.

That activity can produce Social Improvement.

The same activity can also generate Social Destruction, disorder, Crises and Conflicts, and other consequences.

Therefore:

Human progress does not automatically imply increased Global Human Security.

The central problem is to determine how changes produced through human activity affect the trajectory of GHS.

PART XII — WHAT WOULD MAKE THE THEORY TESTABLE?

For the theory to become an empirical mathematical model, each major variable would need an operational definition and an appropriate method of measurement.

Research would need to determine how to measure, among other things:

SI = Social Improvement

SD = Social Destruction

CC = Crises and Conflicts

MMD = Man-Made Disasters

RND = Recurrent Natural Disasters

M = relevant state of Matter

P = human population

HB = Human Behavior

and ultimately:

GHS = the remaining capacity of the human system to sustain human existence

The important task is not merely to assign numbers to these concepts.

The research must determine whether the proposed mathematical relationships actually correspond to observable reality.

Questions for investigation include:

- Does an increase in Social Improvement produce an increase or decrease in GHS under particular system conditions?
- Under what conditions does Social Improvement contribute to Crises and Conflicts?
- Does increasing human capability increase both beneficial and destructive consequences?

- How do Crises and Conflicts affect GHS?
- Under what conditions do changes in GHS increase vulnerability to Human Race Extinction?
- Can the trajectory represented by the original Point 1 → Point 2 → Point 3 = Point A sequence be reproduced from historical or measurable data?

These are empirical and mathematical questions.

The objective of the 2026 reconstruction is to make them sufficiently precise that they can eventually be tested.

PART XIII — FINAL INTERPRETATION

The 2005 theory can be understood as an attempt to construct a mathematical representation of the relationship between:

Matter → Humanity → Human Activity → Social Improvement / Social Destruction → Crises and Conflicts → Global Human Security → Human Race Extinction

The most important original insight is not simply the equation.

It is the recognition that:

Humanity is simultaneously the beneficiary and the modifier of the system upon which humanity depends.

Humans depend upon Matter for their existence.

Humans modify Matter in an effort to improve their condition.

Those modifications can produce Social Improvement, but the same process can also generate Social Destruction, disorder, Crises and Conflicts, and other consequences.

The central problem is therefore not to eliminate human change.

It is to understand how human change affects the capacity of the human system to sustain human existence.

The original mathematical construct begins with:

GHS = f(x)

and identifies relationships including:

CC_man = f(SI_man)

and:

$$\mathbf{HRE = f(CC_man) = f(man)}$$

When Human Race Extinction occurs at Point A, the resulting terminal human condition is:

$$\mathbf{GHS_man = 0}$$

This does not mean that Matter or the physical world becomes zero.

It means that the human system has reached the condition in which there are no humans remaining whose existence can be sustained.

Thus, when Human Race Extinction occurs:

$$\mathbf{Human\ Population = 0}$$

and:

$$\mathbf{GHS = 0}$$

while:

$$\mathbf{Matter \neq 0}$$

The purpose of the 2026 reconstruction is to take the original mathematical construct seriously enough to make its variables, relationships, assumptions, graphical structure, and unresolved mathematical questions explicit—without replacing the original theory with mathematical assumptions that were not established in 2005.

ANNEX 2 — POSSIBLE MATHEMATICAL EXTENSIONS OF THE 2005 THEORY

Salim Maloof — Original 2005 Theory and Mathematical Reconstruction

Original presentation: May 31, 2005

Title: *The Global Human Security Problem: Mathematical Derivation*

Prepared for study and further development

Purpose of Annex 2

The purpose of this annex is to identify mathematical developments that could be undertaken in 2026 to determine whether the Original 2005 Theory can be transformed into a measurable and testable dynamic model.

These developments are not presented as equations established by the 2005 presentation.

The starting point remains the original mathematical construct:

$$\text{GHS} = f(x)$$

The purpose of the mathematical extensions is to investigate the structure represented by that equation, define its variables, examine their relationships, reproduce the original graphical behavior, and determine whether the theory can be tested against evidence.

1. Formalizing the Variable x

The Original 2005 Theory represents Global Human Security as:

$$\text{GHS} = f(x)$$

A first mathematical task is to determine precisely what constitutes x .

For purposes of investigation, x may be represented as a changing collection of variables:

$$x = x(t)$$

A possible representation could include:

$$x(t) = [M(t), PB(t), HB(t), SI(t), SD(t), CC(t), MMD(t), RND(t), \dots]$$

This is not intended to claim that these are the only variables.

The purpose is to create a sufficiently explicit representation of the variables whose changing conditions may affect GHS.

The exact composition of x should ultimately be determined from the theory and from evidence.

2. Defining Global Human Security Dynamically

The original expression:

$$\text{GHS} = f(x)$$

may be developed dynamically as:

$$\text{GHS}(t) = F[x(t)]$$

This formulation does not redefine GHS.

It makes explicit that the capacity of the human system to sustain human existence may change as the underlying conditions change.

The mathematical task is therefore to determine the form of F .

3. Defining the Meaning of GHS

The reconstruction should preserve the conceptual meaning:

GHS = remaining capacity of the human system to sustain human existence

The objective is not initially to force GHS into a predetermined numerical index.

A future quantitative definition must answer:

- What constitutes sustaining capacity?
- How can it be observed?
- How can changes in sustaining capacity be measured?
- What variables determine it?
- Are those variables additive, multiplicative, nonlinear, conditional, or otherwise related?
- Can a numerical GHS be independently reproduced?

These questions must be answered before a definitive numerical GHS function can be established.

4. Formalizing Matter

Matter may be represented as:

$$\mathbf{M} = \mathbf{M}(t)$$

A future dynamic model could investigate the general relationship:

$$d\mathbf{M}/dt = \mathbf{F_M}(\mathbf{M}, \text{Natural Processes, Human Activity, } t)$$

This is deliberately general.

It does not assume that Social Improvement and Social Destruction can simply be added or subtracted from Matter.

The mathematical objective would be to determine how natural processes and human activity jointly affect the changing state of Matter.

5. Formalizing Human Population

Population may be represented as:

$$\mathbf{P} = \mathbf{P}(t)$$

Population is one variable within the larger system.

It should not be used as a substitute for GHS.

In particular, the reconstruction should not assume:

$$\mathbf{GHS} = \mathbf{P} \times \mathbf{Q}$$

unless such a relationship is independently derived and justified.

When Human Race Extinction occurs at Point A:

$$\mathbf{P}(t_A) = 0$$

This can be investigated as a measurable expression of the terminal human condition.

6. Formalizing Human Behavior

Human Behavior may be represented as:

$$\mathbf{HB} = \mathbf{HB}(t)$$

The mathematical task is not simply to classify behavior as positive or negative.

Instead, research should investigate how particular patterns of human behavior affect:

- Matter;
- Social Improvement;
- Social Destruction;
- Crises and Conflicts;
- Man-Made Disasters; and
- ultimately GHS.

Possible future relationships could take the general form:

$$SI(t) = F_{SI}[HB(t), M(t), P(t), T(t), ...]$$

and:

$$SD(t) = F_{SD}[HB(t), M(t), P(t), T(t), ...]$$

These are proposed forms for investigation, not established equations.

7. Mathematical Treatment of Social Improvement

The original theory identifies:

SI_{man} = Social Improvement

The mathematical problem is to determine how Social Improvement changes over time and how those changes affect GHS.

The reconstruction must preserve the proposition:

$\Delta SI > 0$ does not necessarily imply $\Delta GHS > 0$

The mathematical objective is therefore not to assume that Social Improvement is always beneficial to GHS.

Instead, the model should investigate:

$$\Delta GHS = F(\Delta SI, \Delta x)$$

where the effect of Social Improvement depends upon the larger system state.

The rate at which Social Improvement occurs may also require examination. An increase in Social Improvement may have different consequences depending upon the speed at which changes are introduced into the human system. This raises the question of whether the relationship between Social

Improvement, Crises and Conflicts, Social Destruction, and Global Human Security is affected not only by the level of Social Improvement but also by its rate of change or acceleration.

No particular mathematical relationship between the rate of Social Improvement and these variables is established here. This is identified as a possible direction for further mathematical and empirical investigation.

A more complete future model could eventually examine:

$$\Delta GHS = F(\Delta SI, \Delta SD, \Delta CC, \Delta M, \Delta PB, \Delta HB, \dots)$$

but such a function should be derived rather than assumed.

8. Mathematical Treatment of Social Destruction

Social Destruction should remain a distinct variable:

$$SD = SD(t)$$

It should not initially be defined as:

$$SD = SI - \text{something}$$

and Social Improvement and Social Destruction should not automatically be collapsed into:

$$SI - SD$$

The mathematical task is to determine how Social Destruction affects the system independently and through its interactions with other variables.

9. Formalizing Crises and Conflicts

The Original 2005 Theory proposes:

$$CC_{\text{man}} = f(SI_{\text{man}})$$

This relationship should be treated as one of the central propositions to be investigated.

The mathematical task is to determine:

- the form of the function;
- whether the relationship is linear or nonlinear;
- whether it depends upon the state of the system;

- whether there are thresholds;
- whether time delays exist;
- whether the relationship changes according to scale;
- whether the rate or acceleration of Social Improvement affects the relationship;
- and how Crises and Conflicts subsequently affect GHS.

A possible future representation could be:

$$CC(t) = F[SI(t), SD(t), HB(t), M(t), P(t), T(t), \dots]$$

However, this broader expression should not replace the original proposition.

It should be used to investigate what additional variables may be necessary to explain the relationship originally expressed as:

$$CC_{man} = f(SI_{man})$$

10. The Shuffled-Deck Problem

The original relationship:

$$CC_{man} = f(SI_{man})$$

requires a mathematical explanation of why attempts to improve human conditions can generate disorder and conflict.

The conceptual process is:

Existing condition

↓

Human action for improvement

↓

Change

↓

New disorder

↓

Crises and Conflicts

↓

Attempt to establish a new order

This resembles the problem of organizing a shuffled deck of cards.

To organize the cards, one must move them.

In human society, however, the objects being reorganized are themselves human beings, each capable of acting, reacting, pursuing different objectives, and changing the conditions affecting others.

The mathematical problem is therefore to determine whether increasing the scale, speed, acceleration, complexity, or interaction of human changes increases the potential for disorder and Crises and Conflicts.

This provides a possible mathematical interpretation of:

$$\mathbf{CC_man} = \mathbf{f(SI_man)}$$

without treating Social Improvement as inherently bad.

11. Formalizing Man-Made Disasters

The original theory identifies:

MMD = Man-Made Disasters

A future mathematical model could investigate relationships such as:

$$\mathbf{MMD(t)} = \mathbf{F[HB(t), SD(t), CC(t), T(t), ...]}$$

where:

HB = Human Behavior

SD = Social Destruction

CC = Crises and Conflicts

T = technological capability

This is a proposed 2026 extension.

The actual form of the relationship would have to be established through theory and evidence.

12. Formalizing Recurrent Natural Disasters

The original theory identifies:

RND = Recurrent Natural Disasters

The effect of an RND event on humanity may depend upon the condition of the human system at the time of the event.

A possible future formulation is:

Impact_RND = F[RND, Population, Resources, Environment, Human Conditions]

Again, this is a proposed extension rather than an equation from 2005.

The purpose is to investigate why the same natural event may produce different consequences under different human conditions.

13. Developing the Dynamic System

Once the principal variables have been defined, a future model could investigate a general dynamic system:

$dx/dt = F[x(t), \text{Natural Processes}(t), \text{Human Activity}(t), t]$

This would provide a mathematical representation of the fact that the variables of the Global Human Security Problem change over time.

The exact components of **F** remain to be determined.

No particular differential equation should be assumed before the underlying relationships have been established.

14. Normalizing the Variables

The original variables do not necessarily have common units.

Before quantitative combination, they may therefore need to be normalized.

For example, a future methodology might represent a selected variable on a common scale:

$R(t) = \text{value between 0 and 1}$

or:

CC(t) = value between 0 and 1

But normalization itself does not solve the mathematical problem.

Research would still need to establish:

- what the endpoints mean;
- what reference condition is used;
- whether higher values represent more or less of the condition;
- how uncertainty is handled;
- and whether variables should be weighted.

Normalization should therefore follow conceptual and empirical definition rather than precede it.

15. Determining the Functional Form of GHS

Once the variables have been defined and measured, several mathematical forms could be investigated.

For example:

GHS = F(x)

might eventually prove to be:

- additive;
- multiplicative;
- nonlinear;
- differential;
- threshold-based;
- recursive;
- probabilistic; or
- another mathematical form not yet identified.

No form should be selected merely because it is mathematically convenient.

The form must be justified by the theory and tested against evidence.

16. Reconstructing the Original Graphical Trajectory

The Original 2005 Theory presents the sequence:

Point 1 → Point 2 → Point 3 = Point A

and includes an S-shaped graphical representation.

A major mathematical task is therefore to determine whether the original graphical trajectory can be reproduced from a defensible mathematical function.

The reconstruction should not automatically call the curve a logistic curve.

Instead, the research should determine:

- what mathematical function can generate the observed shape;
- what the axes represent;
- what determines the position of Point A;
- what causes the trajectory to move;
- whether the trajectory can move toward or away from a particular condition;
- and whether historical observations can reproduce the graphical structure.

The original graphical form should be treated as something to be explained and tested, not replaced by an assumed function.

17. Mathematical Treatment of Point A

Point A is central to the theory because it represents the actual-time position of the human system.

The original relationships are:

Point 1 → Point 2 → Point 3 = Point A

The mathematical reconstruction should therefore determine the conditions defining the state of the system at Point A and the trajectory leading to that state.

Human Race Extinction is a terminal condition that may occur at Point A if the variables affecting the human system produce extinction at that actual time.

When HRE occurs:

HRE = f(x)

and:

$$\text{GHS_man} = f(x) - \text{HRE}$$

with:

$$\text{GHS_man} = 0$$

The objective is therefore not simply to assign a date to Point A or to assume that Point A represents extinction. It is to identify the mathematical conditions that determine the position of the system at actual time and the conditions under which that position may coincide with Human Race Extinction.

18. Stability and Movement of Point A

A future model could investigate what causes the trajectory associated with Point A to move in a direction that increases or decreases the capacity of the human system to sustain human existence.

The question can be expressed conceptually as:

What changes cause the trajectory of the human system to move toward or away from the terminal human condition?

This is particularly important because Point A represents actual time rather than an automatically predetermined state of Human Race Extinction.

The system may therefore be examined at Point A while humanity continues to exist. At the same time, the model must allow for the possibility that a sufficiently severe event, including a Man-Made Disaster or Recurrent Natural Disaster, could produce Human Race Extinction at that actual point in time.

The effect of change must therefore be evaluated within the complete system, including the possibility of movement toward or away from the terminal human condition.

This is particularly important because the original theory does not treat Social Improvement as automatically increasing GHS.

19. Feedback Relationships

The theory suggests that human beings modify the conditions in which they exist and subsequently respond to those modified conditions.

A future mathematical representation could therefore investigate:

Human Activity → Change in Conditions → Human Response → Further Human Activity

and:

Human Activity → Social Improvement → Changed Conditions → New Interactions → Crises and Conflicts → Further Human Response

These should be treated as feedback relationships rather than simple one-way chains.

20. Social Improvement, Social Destruction and GHS

The mathematical reconstruction should explicitly investigate the proposition:

$\Delta SI > 0$ does not necessarily imply $\Delta GHS > 0$

It should also investigate whether there are conditions under which:

$\Delta SI > 0$ and $\Delta GHS < 0$

This would not mean that Social Improvement is inherently destructive.

It would mean that an improvement measured according to one human objective may produce consequences elsewhere in the system that diminish the remaining capacity to sustain human existence.

This distinction is central to the mathematical problem.

21. Crises and Conflicts and Human Race Extinction

The original theory proposes:

$HRE = f(CC_man) = f(man)$

A future model should investigate how Crises and Conflicts affect the trajectory toward HRE.

The mathematical task would include determining whether the relationship is:

- direct or indirect;
- linear or nonlinear;
- continuous or discontinuous;
- dependent upon the state of GHS;
- dependent upon other variables; or
- characterized by critical conditions.

The original relationship should remain the starting proposition.

22. Possible Critical Conditions

A future mathematical model may identify a critical condition associated with the capacity of the human system to sustain human existence.

For example, one could investigate whether a condition of the form:

$$\mathbf{GHS(t) = GHS_critical}$$

has meaningful mathematical or empirical significance.

However, the existence or value of such a threshold must not be assumed in advance.

It would have to emerge from the mathematical and empirical investigation.

23. Possible Extinction-Risk Extension

Once the deterministic relationships have been sufficiently developed, a probabilistic extension could be investigated.

For example:

$$\lambda_HRE(t) = F[GHS(t), CC(t), MMD(t), RND(t), SD(t), ...]$$

where λ_HRE represents a possible measure of instantaneous extinction risk.

This would be a 2026 mathematical extension.

It is not part of the Original 2005 Theory.

The purpose would be to determine whether the deterministic structure of the theory can eventually support a probabilistic representation of the approach toward HRE.

24. Possible Survival-Probability Model

If an extinction-risk function could be defensibly established, probability methods might eventually be used to estimate the likelihood of Human Race Extinction over a specified period.

Such a model could investigate:

Probability of HRE during a specified period

as a function of the evolving state of the system.

However, probability should not be introduced merely because the problem concerns risk.

The underlying relationships must first be sufficiently defined and supported.

25. Empirical Testing

The mathematical reconstruction ultimately requires empirical testing.

Research should investigate whether observable data can support the relationships proposed by the theory.

Among the questions are:

- Can Social Improvement be measured consistently?
- Can Social Destruction be measured consistently?
- Can Crises and Conflicts be measured in a way relevant to the theory?
- Can the relationship $CC_{man} = f(SI_{man})$ be observed?
- Can the relationship between Crises and Conflicts and HRE be investigated?
- Can changes in GHS be estimated?
- Can the original graphical trajectory be reproduced?
- Can changes in human capability to modify Matter be related to changes in GHS?
- Can conditions be identified in which Social Improvement increases GHS?
- Can conditions be identified in which Social Improvement decreases GHS?
- Does the rate or acceleration of Social Improvement affect its relationship with Global Human Security, Social Destruction, or Crises and Conflicts?

These questions provide a pathway from conceptual theory to empirical investigation.

26. The Ultimate Mathematical Objective

The ultimate objective of the 2026 mathematical development is not to replace the 2005 theory with a different mathematical system.

It is to determine whether the original construct can be made sufficiently explicit to be:

defined, measured, modeled, reproduced, challenged, and tested.

The original foundation remains:

$$\mathbf{GHS = f(x)}$$

The principal original relationships remain:

$$\mathbf{CC_man = f(SI_man)}$$

and:

$$\mathbf{HRE = f(CC_man) = f(man)}$$

The original graphical sequence remains:

$$\mathbf{Point\ 1 \rightarrow Point\ 2 \rightarrow Point\ 3 = Point\ A}$$

and the terminal human condition remains:

$$\mathbf{GHS_man = 0}$$

At Human Race Extinction:

$$\mathbf{Human\ Population = 0}$$

and:

$$\mathbf{GHS = 0}$$

while:

$$\mathbf{Matter \neq 0}$$

The 2026 mathematical work therefore begins with the Original 2005 Theory and asks how its mathematical structure can be developed without changing the propositions that gave rise to it.