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A SHORT REVIEW OF VARIOUS MODELS OF SUSTAINABLE DEVELOPMENT

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ABSTRACT

Sustainable development and sustainability are the most burning topics of the present time. The huge population growth and inefficient resource distribution create civil disorders or social unrest. To study this, many social scientists or budding scientists are thinking about sustainability research. This article is for those beginners, who want to do research in sustainability and dream about world peace. It gives some elementary concepts of various sustainability models. This is also for those who are planning to study sustainability in pursuit of their future career. Various models like the three-pillar model, capital stock model, prism model, and egg model etc. are discussed here in a brief way. Hope this will be helpful to all learners.

Keywords: Sustainability, Sustainable Development, Social Unrest, Civil Disturbance, Three Pillar Model, Capital Stock Model, Prism Model, Egg Model.

I. INTRODUCTION

The 2030 agenda for Sustainable development shares a blueprint for peace and prosperity for people & planet, now and in the future. [1] It is an organizing principle that aims to meet human development as well as maintaining the balance of nature and natural resources. Sustainable development was first institutionalized with the Rio Process initiated at the 1992 Earth Summit in Rio de Janeiro. In 2015, the United Nations General Assembly (UNGA) adopted the Sustainable Development Goals (2015 to 2030) and explained how the goals are integrated and indivisible to maintain sustainable development at the global level. [2] The 1983 UN Commission on Environment and Development (Brundtland Commission) had a big influence on how we use the term sustainability today. As per the Brundtland Report definition of sustainable development is as follows. The report, Our Common Future, defines it as development that "**meets the needs of the present without compromising the ability of future generations to meet their own needs**".[3][4] The report helped bring sustainability into the mainstream of policy discussions. It also popularized the concept of sustainable development.[2] There are 17 Sustainable development goals for which the world is fighting. To some, sustainability is a fuzzy concept. But to achieve the Sustainable Development goals for the sake of Mother Nature, we must follow some model.



Image: Sustainable Development Goals [5]

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Now, we must understand what a model is? A model is nothing but a simplified representation of our real life. A model can give us results based on different situations and future trends. We follow a model to achieve something. Similarly, to achieve the goals of sustainability we must follow some model. It is based on three things- Development, Evaluation & Application. Several models are proposed by various international organizations to achieve Sustainable development goals from time to time. In this article, I am trying to give you a summary-based idea of those.

Importance of this article:

This is a very basic article. It only shares the model concepts and ideas proposed by various bodies to achieve Sustainable Development Goals. Many school students, college students, or budding scientists are planning to work on sustainability soon & and there is no doubt that understanding the concept is an essential need for global peace. We observe that people are frustrated because of the unavailability of their needs, their dreams, etc. Many people are facing FOMO (Fear of Missing Out) syndrome. But we must teach our younger generation how to live a minimalist life and how to live with optimum utilization of resources to save the planet, our only home as of now. The sustainability model may be applied to follow some case studies that will set an example of sustainable lifestyles and I am hopeful that someone in any part of this World will do it with full dedication.

II. MODELS

A. Three pillar model

1. Economy, society & environment are considered as three pillars of sustainability.
2. Social sustainability includes environmental justice, human health, education etc. If we provide effort to increase social sustainability it can also benefit the environment. For example, our diet choices can have a substantial impact on both human health and the health of the environment, therefore advocacy for healthier eating can benefit the environment, too. [6]
3. Economic sustainability includes job creation, innovation, employment, and proper accounting of ecosystem services for optimal cost-benefit analyses. Research shows high rates of employment benefit both the economy and the people's social well-being through the resource security. [7]
4. But today's gig economy places social and economic sustainability at odds with one another. The gig economy causes many people to contribute to the economic sustainability of companies without receiving the social safety nets typically provided by employment in return. Technology such as development of artificial intelligence, robotics can make many people jobless. Therefore, to create economic sustainability innovation must be parallel with the employment.[8]
5. Environment and our mother nature is everything. Without environment, we are just nothing. Environmental sustainability mainly focuses on environmental well-being. Now a day, we are facing various kind of problem due to environmental pollution, green house effects, climate change etc. Protecting the environment benefits people too as environment is the main source of food, habitat, water etc. [9]

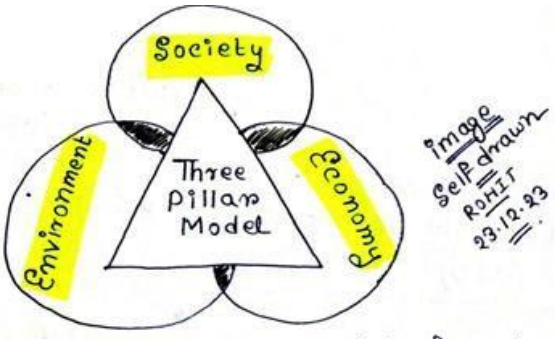


Fig: The three pillar model of sustainability. (Serageldin, 1995)

B. Capital Stock model

1. The capital stock model was proposed by World Bank in the year 1994.
2. Environmental stock, Economic stock and societal stock are part of this.
3. Environmental capital means biodiversity, climate, minerals, clean air, clean water etc.

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4. Human and social capital equates to health, social security, social cohesion, freedom, justice, equality of opportunity, and peace. [10]

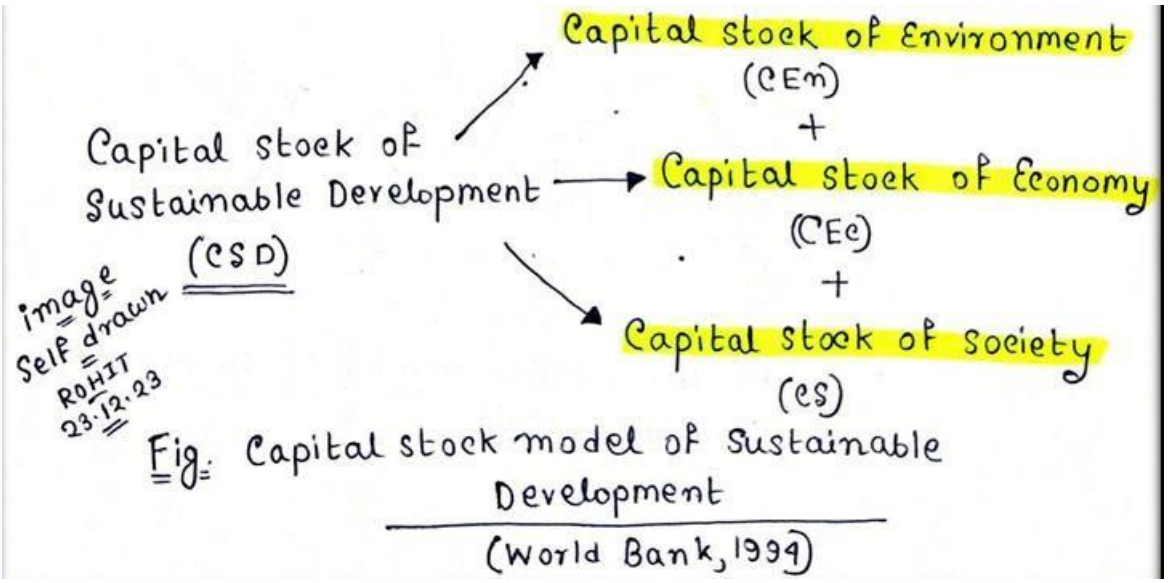


Fig. Capital stock model of Sustainable Development
(World Bank, 1994)

C. Prism model

1. This model was proposed by Stenberg in 2001.
2. The prism model says about four dimensions of sustainable development. The 'prism of sustainable development,' or sometimes called the four pillars model, adapted from Spangenberg and Bonniot (1998) speaks about four dimensions: [11] Economic dimension indicates man-made capital, Environmental dimension indicates natural capital, social dimension indicates human capital and Institutional dimension indicates social capital.
3. In each dimension of the prism of sustainable development, there are imperatives. Criticizing this prism of sustainable development, Kain (2000) [12] argues, that 'the economic dimension tends to include assets emanating from all four dimensions, thus, adding confusion to the description and analysis'. Consequently, the same author proposes a 'MAIN prism of sustainable development.' In this model, he used the terms of mind, artefact, institution, and nature to relieve the prism from the burden of expressions as social and economic, which seem to be more confusing than explanatory.
4. Combining Kain's MAIN prism model with the general prism model we can conclude that the environmental dimension (nature) comprises all natural capital, which may be subdivided into stocks of non-renewable as well stocks of renewable resources. The economic dimension (artefact) represents all man-made material assets, resources such as buildings and roads. The social dimension (mind) can be perceived as the awareness of the individual subject (worldview, knowledge, and experience). The institutional dimension encompasses the organization of our society and the relation between people (Keiner, 2005). [13]

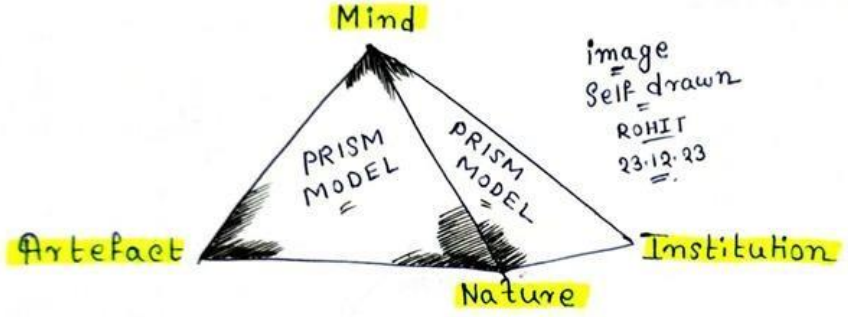


Fig. The Main Prism of Sustainable development
(Stenberg, 2001)

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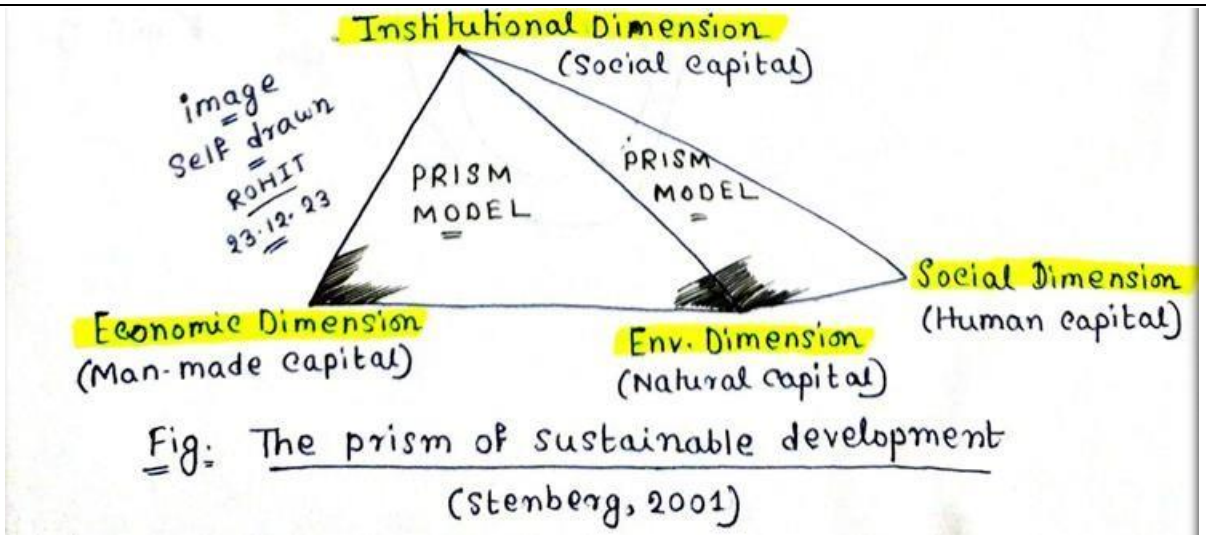


Fig: The prism of sustainable development
(Stenberg, 2001)

D. Egg model

1. The Egg Model was proposed by International Development Research Centre in 1997. But the concept came from idea of IUCN which was proposed on 1994. [14]
2. It indicates the relationship between man and environment like an egg's yolk.
3. According to this, Sustainable development= Human well-being+ Ecosystem well being.
4. This model explain that we are an integral part of ecosystem and one entirely dependent on each other. According to Keiner (2005), an egg is good only if both the white and yolk are good, so a society is well and sustainable only if both, people, and the eco-system, are well. Social and economic development can only occur if the environment offers the necessary resources: raw materials, space for new production sites and jobs, constitutional qualities (recreation, health, etc.). Hence, ecosystem is regarded as a super ordinated system. [13]

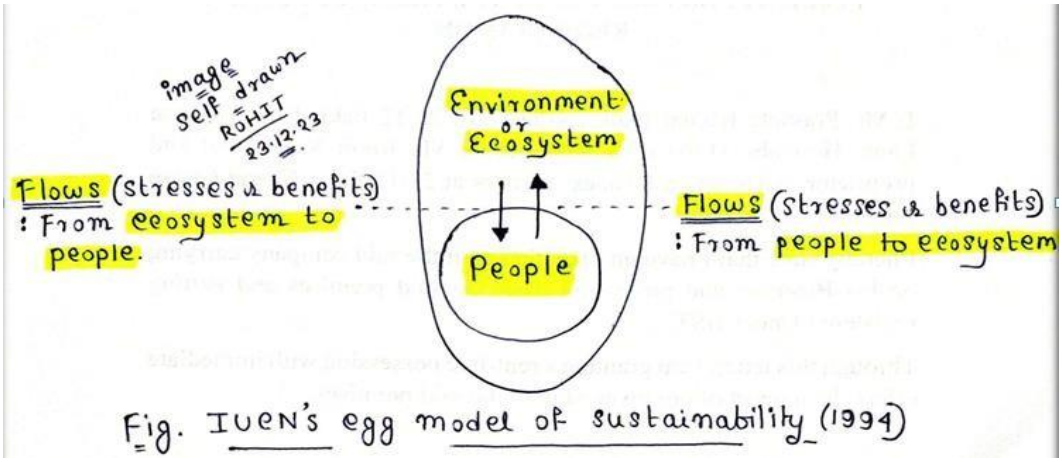


Fig. IUEN's egg model of sustainability (1994)

E. Atkisson's Pyramid Model

We can consider this model as a blue print for sustainable development. The structure of the Pyramid guides through the process of first building a firm base of understanding, searching for and collecting relevant information and ideas, and then focusing and narrowing down to what is important, effective, doable, and something that everyone can agree in. According to this model, cross cultural linkages between society, environment & economic development in the form of agreement can develop sustainability.

The pyramid consists of five levels:

Level one: What is happening? (Indicators: measuring the trend)

Level two: Why is it happening? (Systems: making the connections between the causes, effects, and leverage points)

Level three: What can we do? (Innovations: ideas that make a difference)

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Level four: How to do it? (Strategies: from idea to reality)

Level five: Let's do it! (Actions or agreements: from workshop to real world)

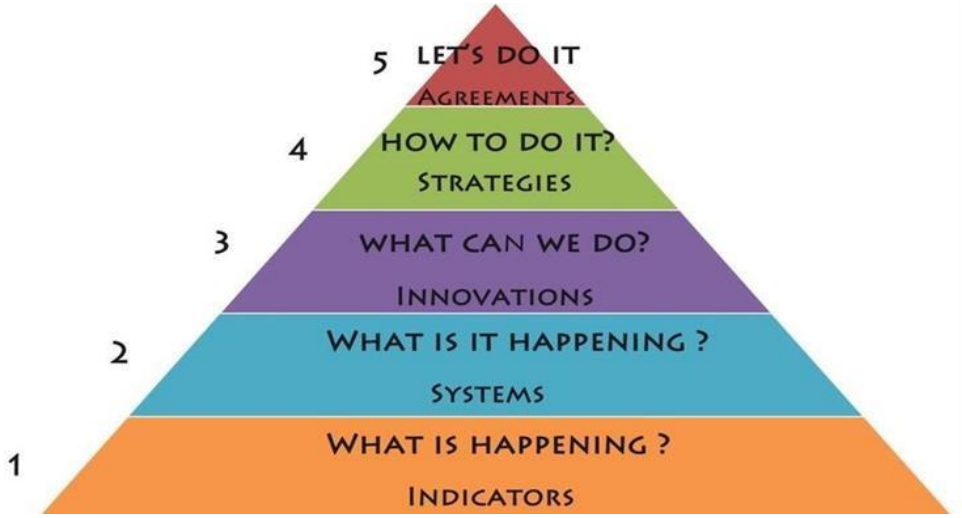


Fig 1. Atkisson's pyramid model of Sustainability [15]

F. Amoeba Model

1. Amoeba, in Dutch language means general method for ecosystem description and assessment. The most important requirement to judge the degree of sustainability is existence of reference values.
2. The Amoeba Approach is used to visually assess a system's condition relative to an optimal condition. The model is circular with various indicators positioned around the outside.
3. The effectiveness of an indicator depends on its clarity. For example,

- Scientists are interested primarily in statistically usable and possibly raw data.
- Political decision makers require some condensation of the data, as well as relating the data to political goals and criteria.
- Public prefer unambiguous statements and condensation to one value.
- We can simply say that "One man's waste is another man's treasure".

4. Amoeba approach can be one tool that helps to make ecosystem more understandable to political decision makers and to the public. Policy options can be evaluated by comparing respective amoeba indicators.



Fig 2. Amoeba Model of Sustainability [16]

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G. Three-legged stool model

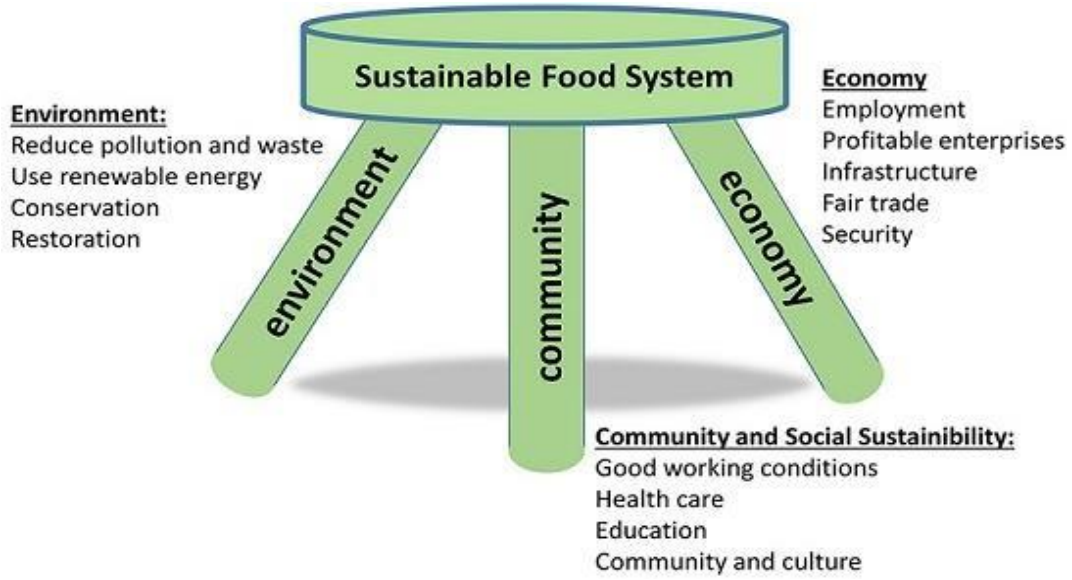


Fig 3. Three-legged stool model of Sustainability [17]

1. It is also known as the 'triple bottom line' perspective.
2. It is very simple way of representing sustainable development.
3. It represents the environment, the economy and society by the 3 separate legs of the stool. If a leg is more or less important (i.e., shorter or longer) than the others, the stool will be unstable (but perhaps still be usable at least for a while). If any leg is missing, then the stool simply will not work. But if all three legs are the same length (i.e., environmental, economic and social considerations have been given equal weight), the result will be a well-balanced stool which will serve its purpose indefinitely - a sustainable stool (Scottish Environment Protection Agency 2002). [18]

H. Two-tiered Sustainability Equilibria Model of Sustainable Development

1. It is one of the most emerging models and considered to be the least criticized one. [19]
2. According to this model, to achieve sustainability across time means recognizing our present activity to achieve Sustainable Development Goals which is represented in a perfect cylinder.
3. This model also represents that sustainability is a dynamic process which requires the time dimension to bend back on itself to form a doughnut shape or torus. This represents the notion that decisions on sustainable development in the present, form the availability of decisions of sustainable development in the future.

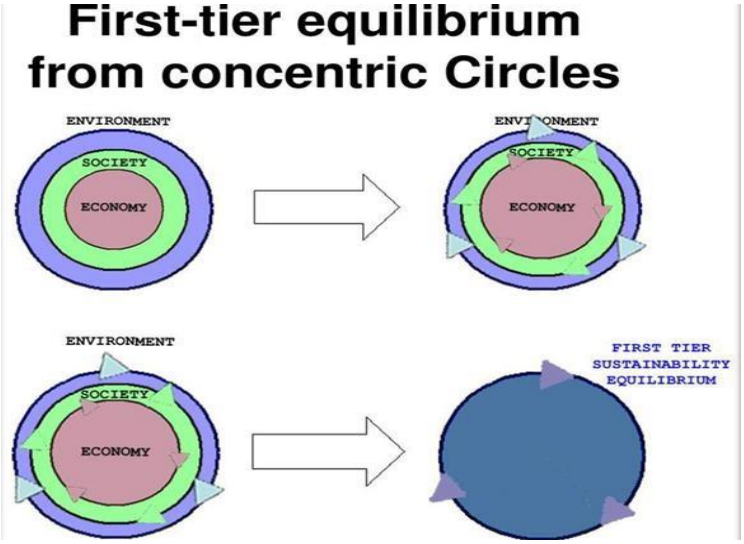


Fig 4. Two tier sustainability equilibria model-1 [20]

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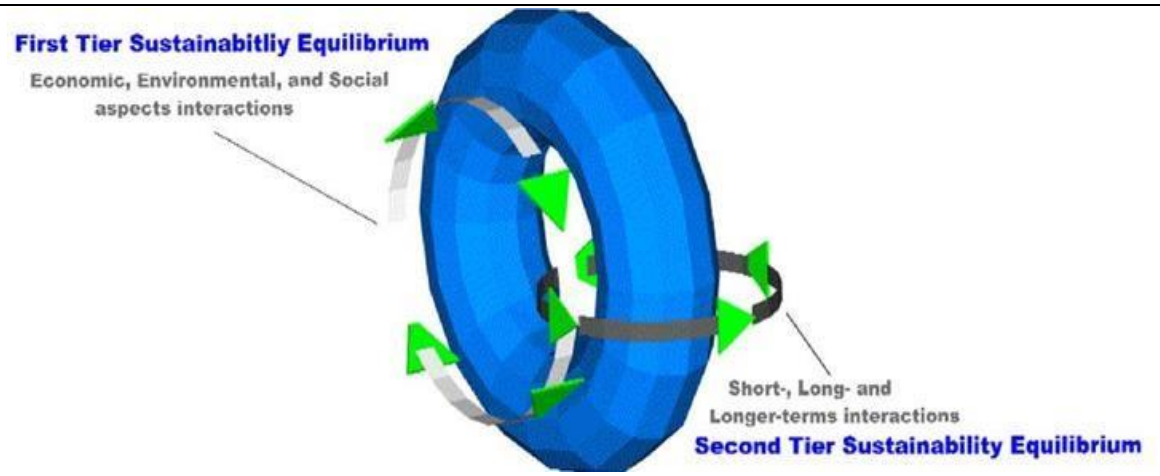


Fig 5. Two tier sustainability equilibria model-2 [21]

III. CONCLUSION

Through this article, I have tried to give an overall idea of various model of sustainability. But the detail criticisms or loopholes of the models are not discussed here. We can apply these models to our real life and set various case studies for future references. Which model is best or which is not suited to the situation of a specific state or country, we cannot say that. Last but not the least, as various studies refer that, there is no such criticism for two-tiered sustainability equilibria model [19] it can be accepted as most promising sustainable development model.

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