International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-10 Issue-1, November 2020

Prevention of Patch Wall (PW) Formation of Building Surfaces by Making the PW's Effects to Below- Awareness-Level of Concern by Making the PW Innovation of Long-Lasting Nature as Attributive Responsibility of the Building's Structural Component

Prasanta Biswas, Atanu Paul, Jayanta Kumar Karmakar, Sohel Sk., Biltu Mondal, Sujay Banerjee, Nabamita Sen, Binka Mondal

Abstract*: To make building habitat & related compound a good from all possible dimensions is the best motive of this paper of research interest. From the very stage of exposition to earth's ambient atmosphere, building materials start experiencing the sufferance; the sufferance by atmosphere on them. It is significant on the exterior portions (of different members like walls, columns, member joints etc.) of the habitat. It is not a new thing to accommodate new concepts to gather with to know the field to prepare the habitat pollution free & with better submergence of knowledge to make it better by reducing its effected pollutions. This time it is the subject of the effect of residence of water gliding from water tank on the habitat, especially on the wall (external) of the habitat. Gliding down on the wall is frequent common phenomenon in the habitat. It is, in any way of happening, found that the water tank (basements, pipe-fixtures etc.) & its normally positioned vertical habitat walls (adjoining) both expose as the thing exposed by the atmosphere, by illustrating their patch-looking exhibition. The water tank which is meant for the drinking water repository for the habitat never holds this exhibition away from exposition of such.

This study is about the determination of impact of such patch-wall on its external environment (ambient) & necessary innovation to reduce & improve the walls under such subjection of expose/effect. By this study, it becomes possible to know the effect & impact of such patch-wall as formed by the Tank & its walls (with the atmospheric chemical reaction) & remedial measures as the innovation to prevent such walls from the damage. With various research scopes, this paper has ended with various insights & discussions of the subject matter to make it a concern of the advanced time coming ahead in our civilization.

Keywords*: Water Tank & Appurtenances, Patch Wall (PW), Innovative Measures (Methodology), Building Orientation, Innovation Implementation Justification.

Revised Manuscript Received on November 30, 2020.

***** Correspondence Author

Prasanta Biswas*, Assistant Professor, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: prasanta2k1119@gmail.com

Atanu Paul, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: atanupal19930@gmail.com

Jayanta Kumar Karmakar, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: karmakarj712@gmail.com.

Sohel Sk., Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: sohelsk.0225@gmail.com

Biltu Mondal, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: biltumondal955@gmail.com

Sujay Banerjee, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: sujaybanerjee24@gmail.com.

Nabamita Sen, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: donasen97@gmail.com

Binka Mondal, Department of Civil Engineering, Global Institute of Management & Technology (G.I.M.T) West Bengal, India. E-mail: binkamondal906@gmail.com

I. INTRODUCTION

'*The matter is the only matter of End Result*' – is the proverb of this research paper certainly. It is noteworthy to state a fact of commonly incidents in our day-to-day's lives & events that we all are based on one common word,i.e., 'need'. This is word which compels us to do that very thing; this is the word which makes us to go beyond to those extra lengths - we know the respective limitations in each of these of the need. Life is all to say the '*thanks*' for having this nature in itself. Otherwise, civilizations would stop along perhaps. Water is the matter. It is by contemporary & traditional research found that human body needs it at the rate of 5 liters per day on an average human's needs. This data is only for drinking requirement. As per IS: 1132-1993, the average domestic water demand is 135 LPCD (liter per capita per day). This contributes to what that our territory (to where we live in; be it township or municipality) is in the infrastructure of water supply division which serves us day & night of our water supply needs. Provision of such authoritative infrastructure is, although, of the insufficient availability & qualitative deficiency of the water to the humanneeds. Water supply scheme of the infrastructure of a city/township, generally, starts from the source of water (raw kind indeed) well up to the tap-ends of the various utilities, houses, buildings etc. In order to facilitate this scheme in congruence to the human needs a temporary storage is generally constructed in every building/utility.

This temporary storage is called as the ***"Water tank"*** or ***'Tank'*** of the building.

There are various appurtenances like pipes of different diameters, pipe-fittings, valves, various automation instruments, costly protective shielding, etc., as required in promoting the water supply of the infrastructural authority to inside the buildings for the human needs of use. Let's designate the Water tank & its involved items of appurtenances by calling as ***"Tank Item"***,simply.

Construction of the tank is often a prime importance to the household owner. Sometimes, people become so emotionalwith it (as because it stores the very matter in it), to the direction of satisfactory decision of where it could be situated to or what the best location it should be of.

In all the buildings, it is often discussed & given with very much intriguing discussions & thoughts of very seriousness, about to the determination of the best location & position of the tank.Somebody might feel, primarily, at the beginning of its construction, just simply as a disturbing object, needing judgmentsto becoming the building component!

In the time when it iscompletely decided the structure as a very important one or rather a part/component of the building structure itself then the entire arouse of how to making it &what the various factors to be considered in its making etc. etc. comes up with fixed & firm decision & initiatives.

Cost of the Tank Item (Water tank & its associated items/appurtenances), is a major factor in providing the Tank to a building. Duty of the infrastructural authority is only to supply to doors. It is not certainly at the altitude the Tank of building. To get a convenient pressure of water, inside the building, all the time, the Tank is situated to a better height as amenable to the building'sowner. It is found that the owners are often turned into very sophisticated nature of mind in this particular component, the Tank Item, out of all the building components. It is by human nature. This is perhaps the reason we see the shape of the Tank as Football, Big bird, Tank with curvy tops etc. This creation is the replication of theirs' entire sophistication & it is as the additional feature of their budget. This shaping creation should not avoid show the owner's judgment about the water preservation in the Tank Item on allalong. Be whatever the budget is poured to the construction of the Tank Item, its looks never remain the same by outlooks & by durableness certainly. Over time-span, the building wall on which the Tank & Tank Item rests on becomes poor- looking & unexciting (like never before!) by formation of color patches (yellowish, brownish, reddish etc.), rusts somewhere, surface blisters, etc. along the entire wall- length. This wall-length is formed of so because of the overflow of water from the Tank during the pumping-in or the storage from the supply. There are chemical reactions that take place between the water & the building wall in the presence of atmospheric weathers. So, here might be questions of about the water quality of the supply. In addition to these questions, there is another aspect of the nuances & nuisances on the wall & wall-length of concern. Given the consideration of having the adequate water quality in the water (as assumption or alike) from the Tank, there are also the instances of such patch formations on the wall surfaces proximity to the Tank & Tank Item. Let's designate the wall-length or the surface of wall subjected to the creation of such formations by calling as '***Patch Wall***', simply **PW**. Creation of a bad feel ultimately from outside about a building is by this Patch Wall which is yellowish & brownish in color due to the Tank Item provision (please see AppendixPW.F).

In Figure 1, a typical general sketch is given where the wall subjected to the PW problem is marked on the wall (ofbuilding) which is in 'direct' touch with the water tank (adjacent wall). The PW is observed to be the pale formation because of gliding down of the overflow water from the water tank. This water flows along the wall surface to the GL. Somewhere the water touches the wall infrequently in interval of the fall, with splashes or else. This phenomenon of the falling of the water is everywhere a common instance. The touches of the water with the wall continue over long time as the phenomenon happens every day & finally create pale patches of yellow &brown color on the wall. This patch is called here by the term PW. Water tank placed on building at some staging height above G.L must always create this nuisance of durability & environmental concern which is the PW & its effect. Overflowing of the water from the tank is given the primary responsibility of making the PW. In this study, investigation of the PW would be done in way that should be able to reduce & solve the problem so caused in &by the PW & to determine its various effects on human by formulationmethodology.

In this research paper the entire discussion is given to describe the determination of the PW effect & its relevant innovation to avoid the PW as a problem, in general to the discussion [(1)]. Besides the sources of causes of the PW formation along with its effects & etc., several research scopes are also discussed in it.

II. GOALS OF THE RESEARCHSTUDY

1. To find out the sources of the PW formation & itseffects.
2. To search & find out the wellness & entire protection of the building wall, particularlyPW.
3. To focus on the Tank & TankItem.
4. To describe the several effects of the PW formation in the TankItem.
5. To determine the impact of the PW on several corners of humanlife.
6. To introduce with the Innovation to provide protection against thePW.
7. To explain the Innovation provision with the Impact level determination.
8. To provide the context of the PW's severity & fight against it by the innovation asrequired.
9. To describe the benefit-cost discussion over the Innovationprovision.
10. To enumerate the several research scopes of thisstudy.

III. ASSUMPTION (METHODOLOGY)

1. The ambient environment which is assumed to be the prevalent zone to be susceptible to human is consisting of the building & its surrounding objects like tree, pond, other buildings, road, drain, socio-demographyetc.
2. Human is directly affected in the influence by the ambient environment.

3. Unless otherwise mentioned, the words 'propounding' & 'postulating' are not similar but are different literally by their own 'literal' meaning as applicable to thestudy.
4. The spread is natural by the Tank as well as the pollution problem of the study. This natural spread is to the extent of human ability & his/her perceivable attitude to treat it as thepollution.
5. The inter-spread from the environment to the human is direct, but the final result (of the pollution problem) is indirectlyresembled.
6. Content of the tank water is assumed to be the prime source of the pollution creation. Associative interaction (like chemical reaction of the water with pipe & building materials) is valid.
7. The tank water (groundwater/supply water) is assumed to be drinkablestandards.
8. The quality of the pervading air/atmosphere surrounding the building is considered to be attributive well up to the biosphere. This atmosphere & also the weather is ignored in the study. Therefore the study is kept applicable to any territory.
9. Impact of the pollution of the study is not uniformly distributed among the inhabitant/visitor of the environment, directly orindirectly.

IV. METHODOLOGY

In human curiosity there is always an internal enhancement to find out a 'search-for-need' to give a rest of the curious thought, in total, wherein he/she achieves a certain degree of fulfillment of the curiosity. This particularity always does not happen but it happens in human. It happens over long-time culture &even also over a very short-time initiation with the object of concern (of the curiosity). Human is like a slave of this thought propagation/whirling of the curiosity culture. Human does always have the creative mind & an extreme utterance to know everything, something beyond. Creative-ability of human has led the mankind to where it belongs to today. Indeed, humanity has nothing to do with the creative sensors of human mind. The sensors always make the creative zones with suitable accords of the human cords of likeability. This ability & its determination of human brain/memory is the focal point of this research study. Here, the research study points to a specific practical situation so highlighted. The overall aim of this study is to find out the probable causes of the situation so forming/formed, various effects as impended by it on the human so exposed to it & to navigate through various methods (methodology) to determine the effect of the situation by formulation of the methodology. Lastly, as a solution of the problem of the practical 'specific' situation, practical remedial measures have been discussed to make & keep the structure so subjected by it (the situation) to a better condition by providing some constructiveinnovations.

As discussed in earlier segments, the specific situation of the subject matter of discussion of this research study is the PW formation which is the problem situation of the study. Keeping this in the centre-point of the study, the determinations (like to find out causes, innovations etc.) are now going to be described in detail. The term 'problem situation' is meant to the problems caused as well as created by the PW as a whole. There might be a host of problems that the PW could create & these are given in the Table 1 where various ages & also in groups the inhabitants like C, Y & O are given with the description of how the PW could have an effect on each of them (the classified inhabitant). But having an effect on the inhabitant is not supposed to be so likely & easily. It is a physical construct both externally & internally that the human would develop over time-dependent exposure on the PW. Every time an inhabitant sees the PW with the patch & colored substances of formation (created by long-time gliding of water from the water tank) the inhabitant is said to have become exposure by the PW & the reaction of the effect of PW starts occurring to gather inside the human long-term memory asareaction event of something memorable. This experience of the exposure with the PW goes on increasing the long-term memory of it, in severe intensities over frequent exposures. The pale substances (yellow, brown patches on the tank &its wall) do create visionary changes in human behavior. Longer the memory higher would be effect & the change in human behavior inall.

Before going into the effects on the inhabitant further, let's go back to the source where this PW effect does actually reside & also to see how the effect gets transformed into the human. The answer lies in the Figure 2. In this sketch, an interface layer is given in between the Environment (E) & the Human (H). On one side of the layer there is the E which is considered here as 'the ambient nature' in the containment of which the PW resides. It is obvious that there is nothing beyond the E of ambient in particular. PW with its effects all the time right from their formation does exist in the E with their extent possibilities of prevalence. Now from this E the PW effects start navigating to flow into the human brain (on having the exposure directly on it or indirectly by listening from others about the PW). This transformation of the PW from E to H given by the Figure 2 does once again prove that there is everything with a proof in the nature. Here the proof is the Interface without which the PW would never be realized & dreamt of with the reaction of behavioral changes, in human mind. This research paper has described to investigate how this effect on H could be determined & consequently the innovation that would be sufficient to solve out the PW effects from the human mind. Secondarily, the structural durability would be this study's goal indeed, in the same innovation. In all, the term E & H both have been thereby applied in the subsequent description as one singular meaning so formed in with respect to the primary objective in view. This singular meaning (E or H) would reflect the PW's effect on human through the E, thereby as it results to H finally so E means (to) H which is nothing but the interface-backed Evalue. The sequential effects of the PW which finally have the Human (H) as the final & resulting destination are given in the Figure 3 which is the schematic diagram of the Figure 1 to get the realization of the PW & its effects on the classified age-groups of H. The Figure 3 is the diagram which is the layout of the discussion of this study describing the inhabitants in the subjective exposure of the PW problem that is going to create an effect on each of them, (C, Y & O), through the ambient environment(E). Here, the Human, H, resides in the Environment, E, which is ambient to them. The term 'ambient' is meant here the internal as well as the external environment the inhabitant are exposed to the problem situation.

To the environment 'external' to the Inhabitant, irrespective of the classified specificity, the humans are practically/directly exposed to the effect of PW.

And, to the 'internal' environment the humans are exposed to by the PW in an indirect way like discussions among parents or friend groups, seeing through/from the window/roof etc., through watching television programme related to that etc. These two types of the environment constitute entirely the term Environment (ambient) which is given by the letter 'E' in this research paper all through. The consecutive ways of acting of the PW effects on the inhabitants are given in the Figure3.

In general, the subjective interest is the diagram as given in the Figure 3 where the PW is the source point of the problem situation whose effects are towards to be effecting on the human (H) in several possible ways by several degrees depending on the inhabitants of various ages so exposed to it in the ambient environment (E). This study has classified the human who are in the exposition of the problem situation to three kinds like C (Children), Y (Young) & O (Old). The detail narrations of these three kinds, owing to the causes (probable & possible) of the PW problem by the different classifications (C, Y & O) of various age-groups of individual inhabitant are given in the Table 1. Also, see the Figure 3 in order to define the research point of interest as discussed in thisstudy.

The term 'problem situation' as created by the PW does not indicate other sectors of meaning than those explained & given by the Figure 4 which gives the several situation-specific aspects of learning. But, this research paper would include only the description of the Psycho-Physical effect of the PW to designating the term 'problem situation' properly to describe the effect of the PW problem with related estimation & methodology.

Regarding the Innovation which is the rational realization of solving out the problem of PW effects it is completely a different segment of description of how the innovation to be chosen, constructed & selected. But, the innovation would be here regarded as the point of solution only which would be able to solve the PW effects. Entire description of this study would go around to find out the PW & its effect determination by formulation & thereafter by values by several formulations & based on these formulations as well as the values the correct innovation measure needs to be chosen out & prepared to make & create the building structure out of any PW effects on theHuman.

Remedial measures to take on the problem of PW as a whole as a solution of the PW problem or effect would be the innovations which are described afterwards to reduce or remove the PW problems. There would be definitely some challenges of every innovation & thereby the effects of the innovation, as hazards, are not in the scope of this research study (Figure 4). Similarly, measuring the physical effect (by PW) on the building is not to be the way of the methodologies as given in this research study, to measure the Psycho-Physical effects on the Inhabitant. Therefore, this study has got its restriction by describing & formulating the PW & its effects on the inhabitant only (Figure 4). The study does have the research scopes of interests for the other two of the determination of the PW effect as the further scope of the study. It is hoped that those determinations would be quite different than the ones which are given in this study's methodology for theinhabitant.

The effects by gradations or levels of degrees like mild (m), moderate (M) & severe (V) are given in the Figure 5 to describe how the effects are caused in to the H to the classified humans like C, Y & O by the PW & this sketch is the one-in-all figure to have the entire things at one place (also see Table 1).

In our environment, effect of any tiny nature by magnitude & all does have cascading impact which goesonincreasing & largely over time. Some impacts we, the inhabitant, are able to conquer over & some are not. At the same instant, some impacts are not so bothersome or significant but some are so obnoxious in nature & consequently very remarkable in making the marks, both physically & psychologically. In this study, our point of subject matter of description is the PW, its causes & effects. There are the commonly available picturesque of the PW happening which are often seen surrounding to our daily life-living. Some clicks have been given in the Figure 1 which shows that how the wall (PW) of the building is subjected to the impact/effect & how it does create the said nuisances of the subject of this study. The entire altitude of the wall touching from the Tank does get colored &over time damaged by the PW. The damage is so significant & long-term over the inhabitant in several ways is termed by the study as PW or PW problem or PW pollution (Table1). To study the impacts so caused by the PW is the subject point of objective of this study. Also, giving the innovative measures to make a solution of the PW problem as a whole is to be the requirement of this research study to make it a complete one in all respects. In doing so, the Table1 would be the first initiation to the knowledge about how the PW does provide the impact/effect on towards the inhabitant or victim exposed by it. This exposition has divided the society in which the inhabitants stay & live, both in-house and elsewhere outside, based on the extent of getting infected or suffered by the impact. This division is of twoparts,

1. Immediate PW Society,&,
2. Inherited PWSociety.

The names so given to are with respect to the PW sufferance on the inhabitant, both individually & by the group. First one is the society & its belonging which are affected by the PW effects immediately & directly. The second one, i.e. Inherited which is the society & its belongings gets affected by the PW effects in a way not directly to the effect's or impact's initiations. Both the society & its people (C, Y, O) could also interchange between them & also become blended by themselves,consequently.

There are various classifications (like C, Y, O & also by ages) made in the entire 'Individual Inhabitant' category given in the Table1, each of which is described with their sufferance by the PW & the category-wise causes (of ways) of the impact/effect. This finding as given in the Table1 is completely by the research study as it reckons to, but to conduct the finding on broader spectrum of research is conveniently out of the scope of this study at the space & time. So far the findings so given in the Table1 are quite interesting & equally attracting to the research interests. They need better screening & modification (if any) although. However, it is postulated with the finding (Table1) that the classification Y(30-40 years) is the time of maturity period of the life-cycle of the impact/effect of the PW.

At this period, all the impacts happened in the earlier categorical classifications, C & etc., become matured & complete at their full ability & the strength.

After this Y, what the effects & the causes (the ways) could be in for the classification 'O' are described accordingly. The human behavior which gets changed by the PW effect/impact is to be here of the ones which are so susceptible & prone to changing is designated & described by the 'postulatory' term Behavior (changed) or Behavior Characteristics (changed). These terms are to the changed condition ofthehuman behavior by the effect of PW which is a consequently formed pollution problem of the PW itself to changing the behavior & these are given with the postulatory examples as they are described so. Actually, the characteristics should correspond to the classification of the inhabitant by their ability to resist the changes/effects caused by the PW pollution & also equally applicable to the other characteristic situation as applicable & validly postulated by the study. In all, the tabulation is self-explanatory & is quite an effort of the research interest requiring to be flourished with broad effort to make the subject accurately & relevantly useful. The tabulation could thereby be termed by '**Table of Postulation**' which is as applicable as found valid itself in this study. This type of tabulation is also of the propounding kind as the given descriptions are to the methodology of research of thisstudy.

In addition, there is a segment given in the Table1 where the effects & the causes as created & contributed with respect to the inhabitant classification type 'GROUP' which are also separately significant of the study. This 'group' discussion point of view is equally important as the Individual inhabitant does because of the fact that gossiping over the things, discussion, advertisement, any media transfer information etc. in a way that gets into the relevance of the inhabitant of the subject matter leading to the level of the PW as thepollution.

Be the Individual or in the group, both the effects & causes are said to be as Direct/Indirect (Table1), as because of the following reasons by the exposure of the PW:

Reasons For Direct Implication (Cause or Effect):

1. Individualexperience.
2. Instantly deep rooted into or close to the long-term memory.
3. In congruence in self so impactful & significant in a very short period oftime.
4. With high in strength of the impact &by avoiding all presuppositions of thoughts at the time by the huge strength of theimpact.
5. As a continuously knocking touch point, leading to long-term memory,permanently.

Reasons For Indirect Implication (Cause or Effect):

1. Group inference/experience as a group member orelse.
2. Instantly deep rooted into or close to the long-term memory.
3. In congruence in self so impactful, significant & thoughtful over period oftime.
4. Stored with high in strength of the impact in the group discussion or any media transfer of knowledge, even other than the PW, at the time & later by the huge strength of the impact by the memory reminiscence of day's event (especially rest time offers it into thebrain).
5. As a continuously knocking touch point, leading to long-term memory,permanently.

In our environment, there must be a process in every effect. That means there must be a model system subjected to an input which causes to the effect. In the study, the sources are the input which are the inhabitants (individual or in group). The effects are what we know from the given Table1. In the tabulation, the causes by which the concern, PW, do provide an impact on the inhabitant are given with respect to thepostulation of the study & its possible extent. These causes are not limited by the ones so given in there, but should include those needing the research interests. These causes are not in direct process to enter into the inhabitant & his/her memory. They get their entries by a process system through a layer of medium which is called here the interface layer (of postulation of the study). That means, initially, the effects/causes of the PW do exist in our environment & depending on the inhabitant (by the classification & individuality; Table1) they become as the PW pollution/problem to the inhabitant by the process through the layer/medium of the interface. It is so an evident by the postulation of the study that there would be the two states of the PW in the process; one should be before entering the interface & other one would be after having passed through the layer of the medium (interface). These two propositions of the states of the formations of the PW are here designated by the letter E & H respectively. E stands for the PW problem existing in the environment (ambient by nature) & H stands for the problem/pollution within or inside the inhabitant/source. This process phenomenon is shown in the Figure 2 wherein it is shown that the transformation of E takes place in passing through the interface to become the formation H.

With this transformation, PW problem/pollution which is existing in the E is getting into the form of H to realize the form of the effect of PW in the Human acting as the source to the PW's ambient effects. Notably, Human lives in an environment which is called here by the term 'Ambient' & also to the places where the PW effects do exist as 'pollution' to the Human or the Inhabitant of the 'ambient'environment.

In Table2, the intensity levels of the transmission process through the interface are given for the various inhabitants, individually in particular. From this tabulation, it is evident by the postulation so made in the Table2 that there should be age-wise (by the classification; Table1) impact levels (by range) which would vary as given in the tabulation. It is completely postulatory based, but of the research interests & the basis of the study as well. In Table3, there is a perspective of the PW in respect its distribution among the various (classified) sources.

This tabulation is to be the 'differently-meant-by' feature in the presentation (as compared to Table1). However, in this tabulation the distribution of the PW is shown with its description which is not different in the definition & meaning but different in the presentation of meaning.

Here, the target sources are classified into the three types which are based on the educational level of the people in the society. The study has focused on the impact on the people of marked difference in education.

Also there is the description of the blend by the two types. In tabulation, the effects are given with the consideration of the literature or educational mind of the target source.

So by so, in order to determine the true nature of the society under the PW dominance this categorization & description should be required to understand the PW effect better & to navigate through the all possible insights of the sources which make the effects on whole a troublesome & thoughtful problem on social life of the inhabitant.

Besides various criteria factors, 'Value Recognition' criteria is kept there to know the magnitude that they think relevant for the effect to be persistent & cautious. In the causes, the perceptionofunderstanding is the reason of why the PW to be as problematic as pollution. The answers by the target sources are given & they have got the same answer after all that is the behavior changed. It is a postulating fact considered by the study that effects as caused to all the sources of kinds would lead to final stage of affection or sufferance that is change in behavior which is of not a desired kind from the 'healthy' human perspective. Therefore the changed condition of the human behavior is unexpected & unhealthy which is the reason for which the tabulation's last column is meant by so.

It'd be meaningful to study the three tabulations (Table1, Table2 & Table3) altogether with the relevant figures or depictions to know the PW better & its impacts on the sources. Because the innovations, as required to solve the effects & problems/pollutions, would be better & clearly brought into the realization to solve the problem as well.

The study has considered a medium of layer or interface in between the E &H. This consideration gives a research direction to how to envisage the PW's existence in the environment & how to go along the existence of the PW's occurrences in H. The interface changes the residence of the PW from E to H. By the transformation so taken place by a 'propounded' concept of the psycho-physical process of the human the residence of PW converts from E to the H to which it (the PW) affects. With this interface, the methodology, in general, has been constructed & this construction is given in the Figure3 where after the transformation of the PW into the H through the E as well as the interface as given by the Figure2 the effect of PW shall go to affect on C, Y & O who are the inhabitants or the (target) sources of the PW. It is quite a psycho-physical process as propounded in the study that takes place by the initiation & ultimate creation of a problem in the H resulting to be as a problem as the pollution to theconcern.

Applying the general construction of the process & transformation using the interface the next broader vision of the Figure3 is given with the perspective of what actual the clarity of the effects of the PW is having &what the portion of it (the effect by the initiation) is the subject matter of the study as the core as primary one. This clarity in the concept is given in the Figure4 where the three perspectives are given as the places to which the initiation results throughtheH. Already discussed that H is the summation of C, Y & O. So, the subject matter of description is about the Psycho- physical effect on the H by the PW as the pollution/problem situation. It is the primary objective of the study. And, the next stage of the study should go to finding the relevant innovation which would be necessary to diminish the effect of the H or to solve the problem situation by the effect quantification as determined by the primary objective of the study. To how to prepare the process into making a solution (innovation) of it as created by the PW the Figure5 is the answer & one of the kind. This diagrammatic figure is also the process system layout model or the functional process of the Method1 & also the Method2. In the figure the position of the solution (i.e., the innovation) is getting shown so as the methods are methodized & described. In all the other methods, this innovation segment would always be there in the position as desired by the methodconcerned.

In all, of all the kinds of the 'innovation implementation' the answer would certainly quite the Figure10 which could be defined to be as a basic diagrammatic layout of the methodically function process of the study, in general. In this figure, all the process elements are shown in their respective positions; particularly, the innovation which is a vital element in decreasing or removing the PW as pollution.

The primary objective of the study which is to determine the impact on human to trace out & formulate the changing pattern of behavior (ultimate stage of the effect by PW) in human (H) is well marked in the figure through the innovation positioning to result the 'unchanged' behavior quality (also by quantification by the study's methodology) in the Human. To get to know the levels of the effect as caused by the PW & the various kinds of the causes of concern, please see the tabulation, Table1, Table 2 & Table3. It is required to mention that these three tabulations & the figures (Figure2 & Figure4 & the innovation of the study) are considered in this study's construction & methodology as the '*propounded'* ones. These are hereby to be of the *assumption* of the study also. These propounded sectors of the concept are thereby required to be taken care with great interest & sincere exercises by the study'srational existence &realization.

It should not be forgotten that the effect determination on the inhabitant would define & prescribe the degree of remedial measures in terms of the innovation so discussed that would be required to be provided on the building structure (by budget). It is mentioned that though the causes & effect magnitudes of the PW so formed of so are not given interest in the discussion but they would be required to know in order to provide the innovation correctly in congruence to the reduction or the removal of the human anxiety or Psycho-Physical problems. It should be not the 'primary' point of thought of this study to how the PW is formed of so or what the materials are responsible or what construction techniques/facilities were made etc. Because these are well thought sections of Civil Engineering definitely, but this research study has envisaged a 'better beyond' of that as this study is only related to the determination & reduction of the Psycho-Physical effects on Human (H) by the PW innovation. So, this study is about to innovate the innovation with justified & scientific manners of deliberations so that the innovation is able to be alive with long time &with suitable, adequate modifications time totime.

Firstly, the methodology to the effect of the determination is described & afterwards, is the innovation description.

In developing the methodology of this study, the following three stages are taken into the consideration:

1. Measure or determine the level of the effect (Psycho-Physical) bymagnitude/formulation.
2. Long-term memory gains (& its magnitude) by C, Y & O.

3. Physical visibility of the 'changed' behavior by the effect on Inhabitant.

Now to reduce the problem of the effect, adequate solutions are hereby to be prescribed & discussed in the following two stages:

1. Determine the problem magnitude to find a solution of it.
2. Physical innovation with respect to building materials consideration also in addition to the reduction of the effect.

It is mentioned here the innovation should be sufficientlystable from the following threes (Figure 2):

1. Materials or decoration of the Building by theinnovation.
2. Psycho-Physical Effect reduction by theinnovation.
3. Hazard reduction of the innovation itself by the innovation.

Note:Level of the PW's effect in all the cases (C, Y & O) of the concern, is to be determined & evaluated, assuming the transformation of E's to the H's by the interface layer reaction, in thecase.

Following methods are discussed to evaluate, measure & determine the level (H) of the effect by the PW on inhabitant & thereafter the magnitude of the effect is determined & described.

V. METHOD 1 (GENERAL):

In developing the innovation, the level of the effect is essential, to the reduction to the human effect. In knowing the level, the subjective discussion would go into the functional relationship of H & E & it is hereby given in the following by the functional (f) relation as they are so attached to.

H = f (E); H = Dependent function; E=Independent function. E has three sub-functions for the C, Y &O. These sub- functions of E be f (H_C), f (H_Y) &f (H_O) for the C, Y & O respectively.

Thereby, C + Y + O = H

Functionally, $f(H_C) + f(H_Y) + f(H_O) = f(H)$ . . . Eq.(1)

It is thereforth the summation of all the effects experienced & exposed to the inhabitant by the PW, describing as a measure of the PW's effect on human. Notably, this effect must start from the E (environment; ambient) - it should be remembered always.

Now, each of the functional components of H is written mathematically as,

$f(H_C)=a_1H_{C1} + b_1H_{C2} + e_1H_{C3} + \ldots + n_1H_{Cn}$

$f(H_Y)=a_2H_{Y1} + b_2H_{Y2} + e_3H_{Y3} + \ldots + n_2H_{Yn}$

$f(H_O)=a_3H_{O1} + b_3H_{O2} + e_3H_{O3} + \ldots + n_3H_{On}$

where,

a, b, e,. . . , n = constants for their respective variables in the functional relation.

H_{C1}, H_{C2}, H_{C3} , . . . , H_{Cn} = variables corresponding to their constants in the functional relation (Table4).

In a simple way of the mathematical relation & establishment of the Eq.(1), the following would thereby be the methodology of the Method 1 which shouldbe:

PW Effect as impending on H = Sum of [(Constants) multiplied by ('Attitudinal' Effects of Human)]

The term **'*Attitudinal*'** is very crude & acute to the sensory reception of the individual human. It varies from human to human. That means, the term includes only those attitudes or behaviors of human which get disturbed or influenced & finally changed by the PW & it is the effect so called on here & it is none other than the term 'PW Effect' which is entirely constituted bythem.

The innovation should be in satisfactory accomplishment of the following (Figure5 & Table4):

Innovation ≥ PW Effect, H

Ascertaining of adequacy of the innovation might be obtained using various studies like Questionnaire study, Survey analysis, Delphi study & etc. These including also the qualitative studies give the confirmation & checks to the degree of the innovation required &provided.

Final ascertainment of the innovation stability & implementation would require provisionary layouts of the concern & the provisions must be established with the great care of the concern to the nation's interest.

VI. METHOD 2 (GENERAL–VECTOR):

By vector analysis the effect determination is determined here in this method & it would quite the optimum determination.

In three dimensional co-ordinates i, j & k the general functional relationship of the H with the C, Y & O in vectorial presentation would be,$H = C + Y + O$

$$\text{Or, } \vec{H} = \vec{C} + \vec{Y} + \vec{O} \qquad \ldots \text{Eq. (2)}$$

It is evident & clear from the Eq.(2) that the functional attachment of the components of H vector is in the vectorial positioning in the three-dimensional rectangular co-ordinate system. Components of the Eq.(2) are to the formation after the transformation from E to H of the PW impact/effect. The components, (C, Y & O) as given in the Figure6 are the resultant and/or resultant function of the associated H-vectors which by the concerned level of the PW's effect/impact/target are formed after the interface is in the transformation use of E's to H's. Figure6 has given with the exemplary illustration of the formation of the vector O which is getting formed by the associated vectors $(H_O)_x$, $(H_O)_y$ & $(H_O)_z$ respective to the reference axes system ofthree dimensional, x-y-z, perspective. After the formation of all H's of a particular case-sensitive impact level by PW the diagram that is expected/postulated to be formed is given in the Figure6 which is the reference diagram & its description/formulation is of thefollows:

Each of the components should be written & explained by their vectorial measures & related vectors. Say for an example, for the vector C, following would be the vector equation of it,

Resultant vector of C is given by, $\vec{C} = H_{C_1}i + H_{C_2}j + H_{C_3}k$

where,

i, j & k = the vector co-ordinate (axial; 3-dimension).

H_{C_1}, H_{C_2} & H_{C_3} = the vector function of the correspondingcomponent (i, j & k) of the attributes or the behavior of the human subjected to the PW effect.

Likewise C, the similar way should be followed to determine the resultant vector of Y & O. It should be mentioned that in this method only the variables (not any constant like in the Method 1) are taken in the equation of measurement/determination.

This is indeed one of the advantages of using vectoranalysis. Thereby, magnitude of the Resultant vector of $\vec{C}, \vec{Y}$ & $\vec{O}$ as,

$$C = \sqrt{\left(H_{C_1}^2 + H_{C_2}^2 + H_{C_3}^2\right)}$$

Similarly, for the vectors Y & O as,

$$Y = \sqrt{\left(H_{Y_1}^2 + H_{Y_2}^2 + H_{Y_3}^2\right)}$$

$$O = \sqrt{\left(H_{O_1}^2 + H_{O_2}^2 + H_{O_3}^2\right)}$$

where, the 'rectangular' co-ordinatecomponentvectorsformingthevector $\vec{C}, \vec{Y}$ & $\vec{O}$be in theirrespective3-dimensional co-ordinate presentation in the resultant formulation. Notably, H_{C_1}, H_{C_2}&H_{C_3} be the component vector in the formulation of the vector $\vec{C}$ Likewise, H_{Y_1}, H_{Y_2} & H_{Y_3} for the vector $\vec{Y}$&H_{O_1} , H_{O_2} & H_{O_3} for the vector $\vec{O}$.These 3- dimensional features of the each of the resultant vector in their respective formation are given in the Figure6, wherein $(H_O)_x$, $(H_O)_y$ & $(H_O)_z$ = H_{O_1} , H_{O_2} & H_{O_3} respectively (Table5).

In this way, from the formation to the final resultant of the vectorial representation in the co-ordinate system this method would be able to determine a stable & better formulation &magnitude of the PWeffect.

Now by summing C, Y & O the total PW effect in terms of H is possible to be determined in an accurate way of the measurement, using theEq.(2).

The innovation should be in satisfactory accomplishment of the following (Figure5, Figure6 & Table5):

Innovation ≥ PW Effect i.e., the H vector magnitude

Ascertaining of adequacy of the innovation might be obtained using various studies of qualitative & quantitative concern. Budgetary limitations prescribe range of the study.

VII. METHOD 3 (WEIGHTAGE – EFFECT LEVEL):

In this method, a simple mathematical procedure is followed to determine the PW effect. In the procedure three kinds of the effect have been considered, namely Mild effect (m), Moderate effect (M) & Severe effect (V). Each of these classified effects is further signified by a particular range of their domination in the computation (Table6 & Appendix). Further of it, a specified value of constant is attached to each of the effects (classified) in multiplied form to get to the realistic magnitude of each of them in the PW effect computation.

Let, m = Mild effect; M = Moderate effect; V = Severe effect; E = Environment (ambient); H=Human (ambient).

Classified effects are assumed to be formed & distributed in the ambience by their respective values of the ranges. The environment, E, as a complete containment of the effects, would be the representative in a functional relationship with its constituents. With this inevitable &spontaneous property, the following relationship is written by the functionalformation:

E = f(PW); f = functional notation.

Or, H = f(PW)

where, H & PW be the effect on human (H) & PW effect itself respectively. In the H, there would be the classified effects of the PW on C, Y & O by the effect of the PW itself. In the PW, there would be the magnitude of the PW effect, in full, which is required to be determined. It is assumed that the entire PW effects would be acting on all the inhabitants (C, Y & O of H) individually (please see Method 1 & Method 2 to have the concept of how the individual acts in the E of thePW).

An interface layer is assumed to be existing in the methodology which makes the transfer process of the PW effect from E to H. This layer should always be there asan impending one &on every time an inhabitant starts to becomeexposed of by the PW & its effects.Thisinterface layer which is given in the Figure2 is said to be valid equallyfor all the methods described & given in this methodology of thestudy.

In determining the PW effect (H), a mathematical functional relationship is written as follows (Figure7, Figure11, Table6 & Appendix PW):

H = E = f(m,M,V) = ma + Mb+Vc . . .Eq.(3)

where, a, b, c = constant (also known as Weightage).

For measurement unit of the variables of the Eq.(3), the tabulation, Table7, may be suggested with.

The equation, Eq.(3), is interesting here as the constants so attached to are equally significant to be resembled as the Weightage Factor of the kind or the level of the PW effect. On summation of all the attributed values (say, ma, Mb etc.) of the effects so caused in (on the individual inhabitant) the entire effect of the PW would be able to be determined. With the H value in mind, the corresponding measure of innovation should be provided & it should conform to the followingcriteria:

Innovation ≥ H value

The function H of the Method 3 that should be a representative function of E provided the interface layer's characteristics as valid as reactive to the case (C/Y/O), must negotiate & implement the corresponding innovation measures (please see the appendices) to become receded by & reduced by the innovation. Thereby, H value would be in spontaneity by its property which would go on existing in the ambience, as E, to supply an effect on its visitors as H's; be it level C, Y & O by individually or integrally by combination of thelevel.

Amount of the effect that would affect on the inhabitant by the totality of E, but the symptoms or the actual initiation that the individual inhabitant would get or realize would be varying from age to ages, keeping the human metabolism factors unaltered, invariably asapplicable.

Ascertaining of adequacy of the innovation should be by the established study of qualitative & quantitative nature which should not restrict environmental impact of the innovation. Ascertainment must although serve cutting-edge of the innovation limitation & itsbudget.

Note: The value of the H value, for computation, is given in the appendix, Appendix PW.A which is the general layout to be followed of & detail classified ranges of the constants (a, b & c) over the ranges (m, M & V) by the level or degree of effects have been tabulated in the appendices from Appendix PW.1 to Appendix PW.5 to have the impact level scenarios of the PW. Profiles of the variation ofthe variables of Eq.(3) are determined & given in the Figure11 as respective to the AppendixPW.

VIII. METHOD 4 (RANKING – REACTION):

This method might be thought of as a continuation of the Method 3 or a kind of modification over the earlier method, Method 3.

The formulation which is to be taken to the effect computation of the PW is given in the following:

H = E = (Rate Constant)*(Ranking)*(Weightage) . . . Eq.(4) where, * = Multiplication sign.

H = E = PW Effect as existing in ambient environment E as impending on the H (i.e., the PW identity with the interface in between the E & H).

Unit of measurement of application in each of the variables given in the Eq.(4) is given & detailed in the Table7. The amount of E is to be always said with the how much Unit as the effect of PW on E or H.

Let,

a, b, c, . . . , n = Rate constant (seconds per day), i.e., the exposure duration=the time duration exposed by the items of concern by the PW.

L, I, F, . . . , N = Ranking corresponding to the rate constant=ranks applied in arranging in a sequential order of the various items of concern. These items are all human related as for the human conscious nature of this study's importance. These items may include various psycho-physical attributes or qualities that may get a hindrance or a significant chance of behavioral change in human. These items might be cognition (i.e., cognitive ability), personal involvement, relatedness factors, physique (or physical condition), age, sex, marital status, education & various socio-demographic items of importance. The list of the concerns would vary by the classified groups of C, Y & O.

p,q,w . . . , Z = Weightages corresponding to rate constants.

Thereby, the formulation of the Eq.(1) becomes as,

$H1=E1 = (aLp)$

$H2=E2 = (bIq)$

$H3=E3 = (cFw)$. . . . . $E_N = (nNZ)$

By summation (Figure8 & Table7),

$H = E = E1 + E2 + E3 + \ldots + E_N = H1 + H2 + H3 + \ldots + H_N$

Or, $H = (aLp) + (bIq) + (cFw) + \ldots + (nNZ)$ . . .Eq.(4.0)

In this way, the entire effect of PW as E or H is possible to be determined in a better & accurate way of the computation than earlier & its is given by the Eq.(4.0) in this method, Method4.

With this, several descriptions are possible to be as the E value computation. Here is <u>another</u> time-dependent variable creature of the determination like the Eq.(4) given in the following to determine the Effect, E:

$H_T = E_T = (T*N*W_A)$ . . .Eq.(4.00)

where, T=Total Average Residence Time (T.A.R.T) in day varying from 1 day to 365 days = Average time exposed by the PW (computed over a time-specific zone of the study).

W_A = Average weightage (in %age or fraction) = Total weightage (summation)/Number (N).

N = Total number of the items.

The two formulations, Eq.(4.0) & Eq.(4.00) are different by their nature of formation. The latter equation might be seemed as the average one to the determination. Yet, each is having of the general respective field of importance. Unit of E in the Eq.(4.0) & Eq.(4.00) is the same i.e., Unit-hours or simply Unit respectively.

<u>Final Value Determination:</u>

It is hereby decided to consider the 'Final' value of E by the Method4 & it should be the <u>higher</u> one between the Eq.(4.0) & Eq.(4.00). In no case, the Eq.(4.00) might be found useful.

A comparative & methodology by combination of the Eq. (4.0) & Eq.(4.00) in the function of Method 4 is given in the following by the two cases by the variables so involved in & as applied in, i.e.,

Case1:

$H = E = E_T \pm [E_T/(E1+E2+E3+\ldots+E_N]$ . . . Eq.(4.001)

provided that, $E_T > (E1 + E2 + E3 + \ldots + E_N)$

Case2:

$H = E = (E1+E2+E3+\ldots+E_N) \pm [(E1+E2+E3+\ldots+E_N)/E_T]$ . . . Eq.(4.0010)

provided that, $(E1 + E2 + E3 + \ldots + E_N) > E_T$

These two cases are given with their subjective provision of existence. The sign ′ ± ′ used in both the equations are to the degree of precision that might be considered with. If higher 'stable' accuracy is desired then use the +ve sign & use -ve sign if acute & specific results are desired, in the sense the signs are so given to into the equations.

<u>NOTE:</u> The methodological descriptions as narrated & given by the methods (particularly Eq. 4.001 & Eq. 4.0010), in the Method4, do signify the H value ultimately, considering the E value as prevalent & as 'representative' of its H's in the atmosphere (ambient) by the existence of PW.

Ascertaining of adequacy of the innovation should be by suitable study like Questionnaire study, Survey analysis, Delphi study & etc.

In this way, the determination of the E value as exposed by the PW with its severity of effects is possible to be computed by the Method 4 which is better delineative than the other Methods given in the PW study as for the 'Nil value' capability of the methodological formulation, particularly Eq. 4.001 & Eq. 4.0010. Inter-comparison & Intra-comparison of the findings are welcome with the great endeavors of design & design'sstability.

Now, it is quite becoming a matter of discussion that how the innovation would be & what its various features be. For this the following description is made & it followsas:

IX. INNNOVATIONIMPLEMENTATION:

By the descriptions so far given in this research study, the necessary innovation that should require vast knowledge with respect to effectiveness, stability & durability must encompass the innovation's structural susceptibility after all. Following considerations are prescribed to be kept in mind always in finding out the properinnovation:

1. Roughness consideration of the building wall susceptible [2, 3] to the gliding water coming from the Tank. The path through which the water flows as the gliding water on the PW may be assumed to be along the channel (natural orelse).
2. Penetration ability of the Water into the wall as well as the building structure.

This should not avoid the liquid-heat [4]transfer from the exterior wall to the inside of the building through the PW (please see AppendixPW.F).

3. Heat transfer of the gliding liquid on & along the wall to understand the perceptible & examined effect ofPW.
4. Initiatives as taken & implemented using Green Building [5] terminology & its conventional technology as to be applicable.
5. Effect of roughness on discharge (of the glidingwater).
6. Comparative study [6] could be suggested in having the perspective knowledge of the gliding water in related field & finding their behavioral determination as required. This becomes helpful on the building (wall) surfaces having grown with green grasses, planktons, algae etc. in order to anticipate the proper innovation quality as itrequires.

With these (not the least indeed), this study has given in its description the kinds of the innovation that the PW innovation needs to give to the building (wall) a better, stable & competentguide.

By the methodology so described so far in this study, there must be a stage of innovation after all the processes (internal) are complete in all respects. In all the figures provided it is evident that the stage 'innovation' would be a required basis of necessity in the methodological process/method to reduce &solve the problem of the concern. All the methods (innovative) described are given in their respective schematic diagrammetric presentation in the Figure5, Figure6, Figure7 & Figure8. These figures are completely innovative & leading to the innovation requirement. The methods are fixed yetby the discussions so given in this study, but not the innovation in any possible way. So, the innovations are kept as the flexible field where various possibilities could be well placed as for its acceptance after the required verification & examination as applicable as to be the competent enough to deal with the problem statement as well as the H value so obtained. Given tabulations (Table4, Table5, Table6 & Table7) are also meant to be in connection with the method in relevance. However the matter of discussion here is how decide the innovation measure so as to decrease the problem of the PW inparticular.

About the Innovation, a schematic diagram (sketch) is given in the Figure 9 & its subsequent forms are in the Figure 9a, Figure 9b & Figure 9c. The innovation so being talked about is here the insertion of a particular layer of materials in thicknesses below the surface of the wall of building. This layer of materials is called as the **'innovation'** which is thought of to be competent against the formation of the PW on the building (Figure10).

In the innovation, layers of materials could be different by thickness & nature. In the Figure 9, there are the two kinds of such materials prescribed to be provided in a way so given in the relevant figure. The innovation should start after the building brickwork outwards. The first innovation layer given is the **Intermediate material** which is the first & foremost layer of material in the place. After this, the cardinal layer which is called as the **Protective layer** is given at the core of the innovation. Beyond the cardinallayer another material by layer which is called as the **Filler material** is said to be provided. This is the final layer in the innovation. On both sides of the innovation (i.e., the batch of the materials by layers) there could be the facility & scope to provide the adequate & required materials to adjust & finish with the buildingstructure.

Now, regarding the nature of the materials, it is also kept universal to prescribe of. The materials could be kind of having the water resistant property, weathering resistant as filler agent, & etc of such kind to reduce the penetration or permeation of the water from the wall surface to go inside the building structure.

The innovation should be implemented in the building so that the **External Wall** could be painted with as usual materials like plaster of Paris&etc.

Continuity in structure in the building construction/materials on both sides of the innovation (a complete batch) should be maintained properly so that the implementation is well-received by the building itself in all respect over long-time.

All the layers of materials should be of sufficient thickness to provide the adequate functionability & stability to the structure itself. This measure of 'thickness' is very important parameter to determine. It is after all the governing matter which controls the entire things of the innovation with respect cost effectiveness, structural stability, durability &homogeneity.

The cover thicknesses are to the designer in particular extent of flexibility subject to the entire stability.

In this study, there are the two types of the innovation. They have the similarity in the way of overall composition & textural layout, but the difference lies in the internal distributions of various components in the innovation. Innovations of these two types are given in the Figure9 & Figure9a wherein the difference could be well received by the relevant sketches. In the earlier one, in the selection, of way & pattern, the materials are quite distinct & comparable than the latter by the material provision &layer provision. In the latter one (Figure9a & Figure9b), there is only single layer of material selected & provided in the innovation. This single provision of the material by a single individual layer is here termed as **Protection Agent** which could be of any kind of material by degree of hardness & flexibility. Figure9a gives this layer wellindicated by the term as well on its 3-dimensional view & the **Weathering Face** is visible in the sketch provided. Subjectively, the wall surface subjected to the tank's fallen water (as overflow or else) is to be the **Weathering Face** of the building. These two sketches are in relation to each other. Figure9b which is the side-elevation view of the Figure9a gives the positional information of the various distinctive components of the innovation type. It has a special kind of brickwork also which might or might not the core part of the building wall – though, in the figure it is kept apart from the main building structure. The brickwork should be of **corrosion proof brickwork** separated by mortar in general, which means, it must provide sufficient resistant to corrosionability of the wall-surface water inside, in addition to the penetrability of the water gliding from the tank. All the dimensions such as thickness, cover etc. of vertical & horizontal progress of the materials construction should be designed & provided with adequate innovative flexibility in mind. So, the innovations have a great field of research interest & scope in terms of design, implementation & overall justifiableness (please see AppendixPW.F).

In the discussion, another structural component is given in the innovation implementation which is the base slab (Figure 9c).

This type of slab arrangement is generally provided as a support structure component on which a certain aperture (instrument aperture) is kept well marked for giving a stable positioning & resting of the equipment/instrument.

In the description, object of interest of the 'instrument' category (i.e., aperture) should be the Water tank which may be Reinforced Cement Concrete (R.C.C) or P.V.C or anything else. In such 'resting' base slab, the provision to be provided is given in the Figure 9c, of the Innovation implementation. In this way, innovation of the kind should be provided in order to diminish or solve the problem of PW formation in the building structure, having or not having the possibility of forming it by that (Tank item)(1).

In addition, there might be some other measures of innovation to the subject matter of concern & it should be, not to least of it:

1. Orientation (of less atmosphericpollution/hazards).
2. Off-placement of tank & its appurtenance towall.
3. Use of plastic/PVC materials inall.
4. Plasticcoating.
5. Plastic colorpaint.
6. Using long overflow-pipe (wall surfaceavoidance).
7. Using glass covered (even, on tank to seetank-filling).
8. Electric sensor (to automate the tank filingtuning).
9. Waterproof materials (e.g., thicket ofgrasses).
10. Periodic maintenance on thewall.

Now, it might be the question of how to ascertain the diminishment or complete solution of the PW problem Figure10 should be the general prescriptive layout of innovation implementation to the PW solution. Also, as already explained earlier & at the end of every respective method (Method1, Method2, Method3 & Method4), the particular stage/study (for the innovation implementation & its justification validity) which is not out of the innovation implementation (scope of future) though is to be acquired by undergoing research & development, both by qualitative & quantitative manners, to the ones not to be to the listed innovations as prescribed & described in the study as the least one. With all, description of the innovation & its necessary components are completed with the broader scope & with hope of the study's applications by the methodology & of the innovativeapplications.

X. RESULT &DISCUSSION

1. It is the research of both of the finding – the impact level (of PW problem) determination & the degree of the innovation required to be implemented to reduce the PW problem.
2. The main focus is to be to make the building structure free from the PW, as generally observed & seen in all kinds of building.
3. Before providing the innovation it is customary to understand the level of innovation (i.e., treatment) required by the Building. In knowing this, the impact level is determined &given in this study. This 'innovation' formulation, as given by the Equation (of Method 1 to Method 4), shall provide the basis oftheknowledge of the innovation by degree needed prior to the innovation application physically & rationally.
4. Regarding the innovation, there should be the effectiveness in selecting the right kind of the material chosen, its thickness & laying & other factors (like location, orientation, positioning, budget, painting etc.) so associated with the innovation.
5. It should be a general fact to consider the innovation as a general component of the building structure as like the other elements like Plumbing, Tank/Tank Item, drainage etc.
6. Proper guidance regarding the provision of the innovation is required to be prepared & established with the view of sustainability to the building as well as the building materials.
7. Weathering effect is a major concern ofbuilding materials. So, the entire incorporation of the innovation needs great care of initiation &control.
8. The innovation could be thought of as equally applicable to anywhere wherever the PW forms in theBuilding.
9. Providing the PW innovation would create the building a better weathering-proof building than ever before & of long-lasting natureindeed.
10. Building with the innovation would be better cost-effective & be having the better cost-benefit value by the time of the serviceability as compared to the building withoutit.

XI. CONCLUSION

1. This is research study which describes the PW problem as a pollution on building created within the building itself. The term 'pollution' is suggested because the PW problem not only creates a bad looking on the structure but also decays the materials physically & practically, resulting to increase the building's capitalcost.
2. People do not usually make it a point as pollution. But it is in their perception like "*how good-looking, once, the building was & still it is looking good although but except THAT patched wall* (PW)*"*. This kind of perception must be in the mind of on-lookers & noteworthily, in the reckoning budget-mind of the building owner indeed. So, the pollution must be highlighted & considered to be as a building pollution toall.
3. Once taken it with a serious objection, buildings would become better in vision (which shall eradicate the *human's 'attributed' perceptions* that might otherwise cause destruction of various normal beliefs of human) & better in sustainable long-lasting nature of status by exposing itself newly & problem-free too much longer than before. So, PW is to be given with the provisionary measures as PW needs to be taken as a serious objection to buildingstructure.
4. Correct determination of the *pollution level* by PW is highly essential. More correct the level evaluation & determination, more effective shall be theimplementation.
5. Incorporation of the innovation would create a *better social life & environment* which would offer benefits to the society people from multi-directions in several dimensions.
6. *Waste Eradication* would perhaps be the next stage of the on-going civilization of humankind after the present era of *Waste Minimization* in now-a-days' civilizations.

So, this research study hopes with this suggestion that the term '*waste'* should include all kinds of pollutions whichcreatebad impaction 'nuances' & 'nuisances' to social-life & environment, to individually & all.

7. The era/stage *Waste Eradication* should be brought in by the mitigatory &*sustainable* initiation to reduce & remove out the present existence of the pollution in particular by providing the techniques, measures, innovations etc. The level of the impaction reduction should also be measured, monitored & controlled so as to generate the level as per the desire of theprocedure.
8. The innovation of this study would *preclude the level of the pollution* &be provided in consistent with the existing level of thepollution.
9. A survey could be facilitated in order to *know/profile the responses* of people in broad before & after the innovation implementation to the pollution problem. The effects of the exposure of the same experiment should be taken over various periodical intervals on same populations in order to understand & treat the *long-time effect* of the subject matter ofconcern.
10. In implementing the innovation with *great effectiveness*, only the long-term sustainability of the *building & its society* (environment) should be considered.

APPENDIX

Appendices are given as the basic deliverables in the Appendix PW(Appendix PW.A as the layout in general)&in its detailingfrom Appendix PW.1 to Appendix PW.5.These are of what is meant to be how the Method 3 (Figure 11) is to be to its own establishment.

ACKNOWLEDGMENT

I, Mr. Prasanta Biswas, on behalf of our entire research team members of Civil Engineering Department of G.I.M.T, West Bengal, India, would like to give the sincere gratitude & respects to the efforts of all those without whom this report would not have been possible to get completed by this challenging time. Thanks to all in this critical prevalent time of Corona Virus (COVID 19) taking thesplendid endeavours behind the success of this research of innovation.

REFERENCES

1. Project Students, Final Year (4th Year) Civil Engineering, Department of Civil Engineering, Global Institute of Management and Technology (GIMT - Approved By All India Council Of Technical Education, AICTE, India; Affiliated By West Bengal University of Technology West Bengal, India), December, 2018, "A Study Report About The Rusting Effects Of The Water Tank On Residential Building Components Irrespective Of Its Capacitative Aspect Than Durable Influence", Krishnanagar, Nadia, Pin 741102 West Bengal.
2. T.W.Lau, N.R.Afshar, "Effect of Roughness On Discharge", UNIMAS e- Journal of Civil Engineering, Vol. 4 Issue 3.
3. Steven E. Yochum, February 2018, "Flow Resistance Coefficient Selection in Natural Channels: A Spreadsheet Too"l, United States Department of Agriculture (USDA), Forest Service, National Stream & Aquatic Ecology Center, Technical Summary, TS-103.2.
4. Yunlu Pan, Dalei Jing ,He Zhang, Xuezeng Zhao, 2018, "Effective Boundary Slip Induced by Surface Roughness and Their Coupled Effect on Convective Heat Transfer of Liquid Flow", MDPI, Basel, Switzerland, Entropy 2018, 20, 334; doi:10.3390/e20050334 www.mdpi.com/journal/entropy.
5. Jim Greenfield, Alan Middleton, DavisWrightTremaine LLP (Defining Success Together), "Green Building Presentation to East King County Bar Association", September 23, 2009. URL: ww.dwt.com.
6. N Mustaffa, N A Ahmad, M A M Razi, Soft Soil Engineering International Conference 2015 (SEIC2015), "Variations of Roughness Coefficients with Flow Depth of Grassed Swale", IOP Publishing, IOP Conf. Series: Materials Science and Engineering, 136 (2016) 012082. doi:10.1088/1757-899X/136/1/012082.

FIGURE & TABLE

(*Figures are not to scale*)

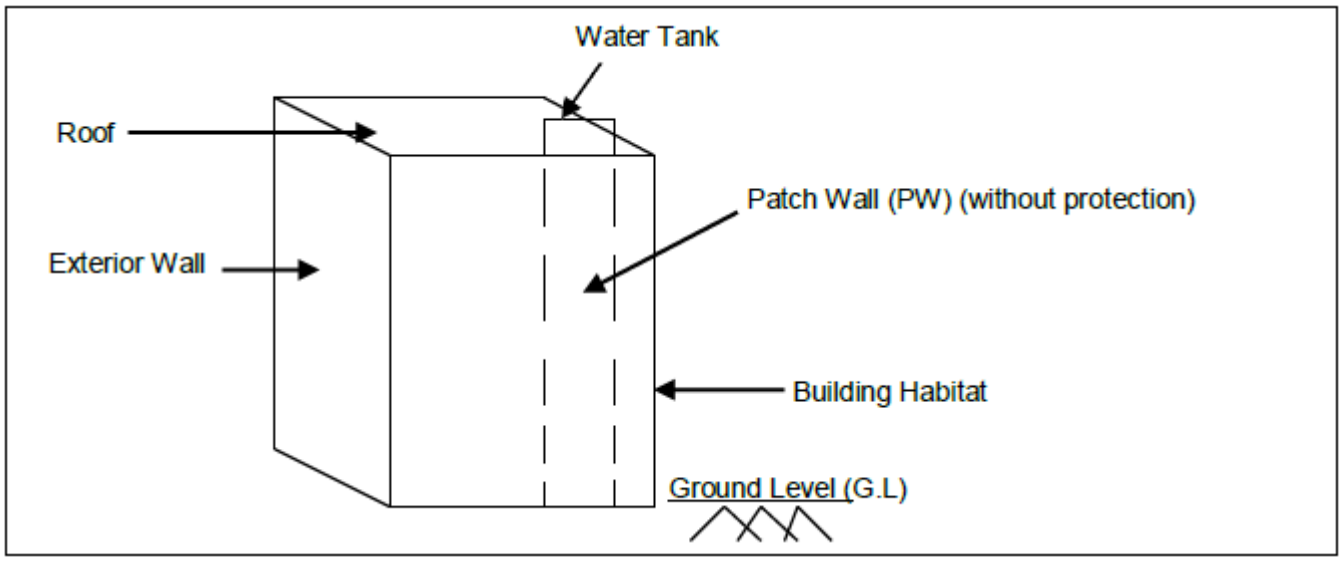

Figure1: Habitat, Tank &The Wall (3DimensionalView)

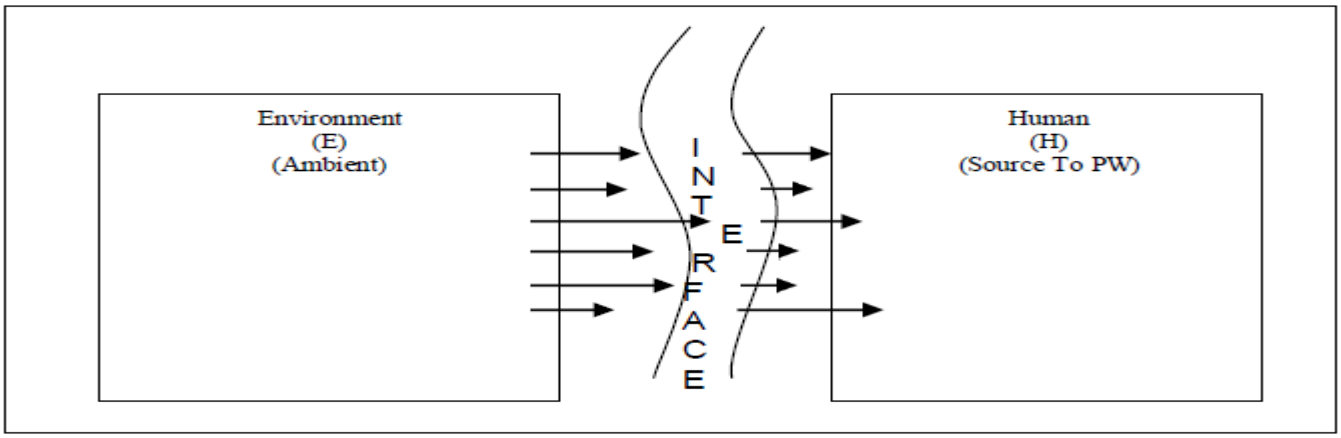

Figure2: PWInterface: PW Effect Formation On Human

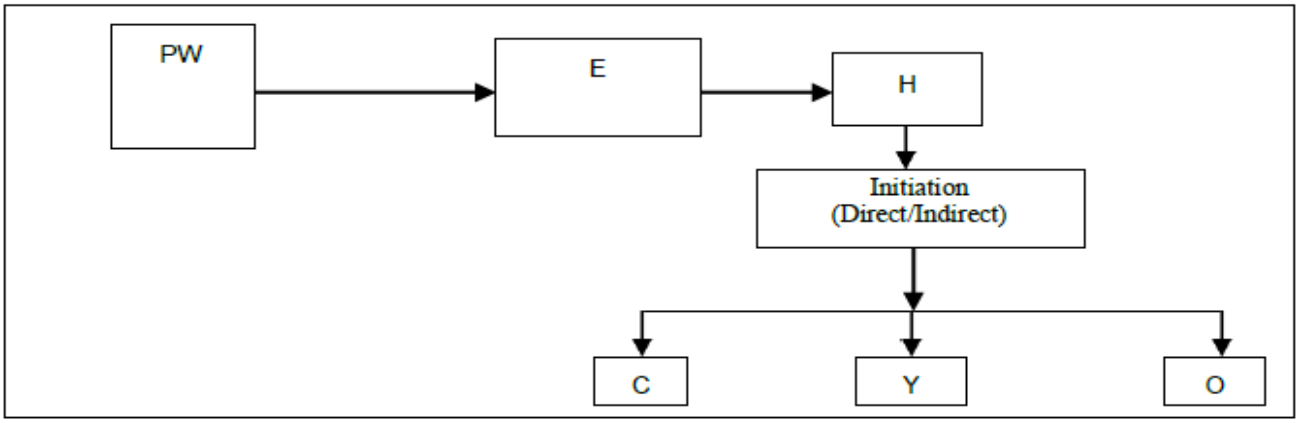

Figure 3: PW & Its Traverse To Effect On Human

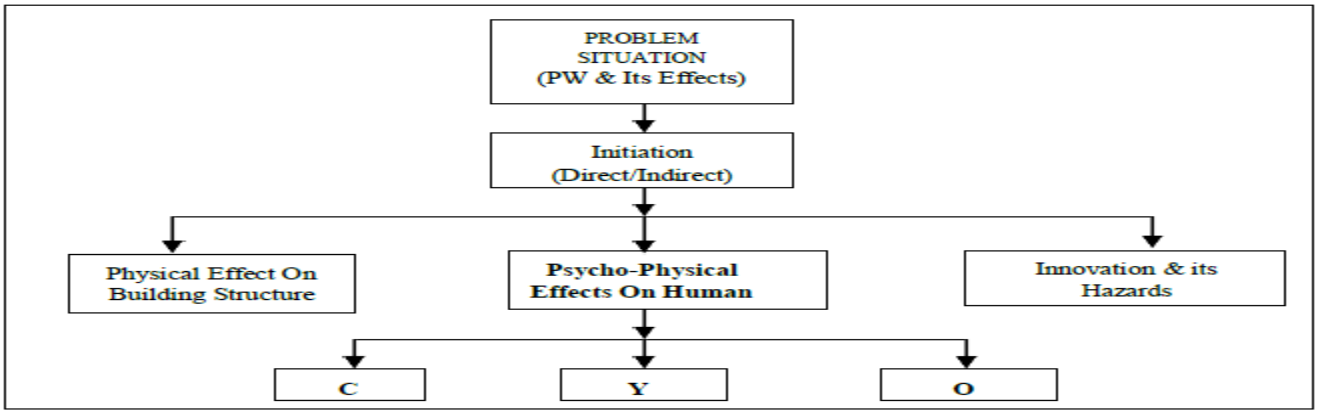

Figure 4: Problem Situation of PW To Be As PW Problem (*also see Figure 1*)

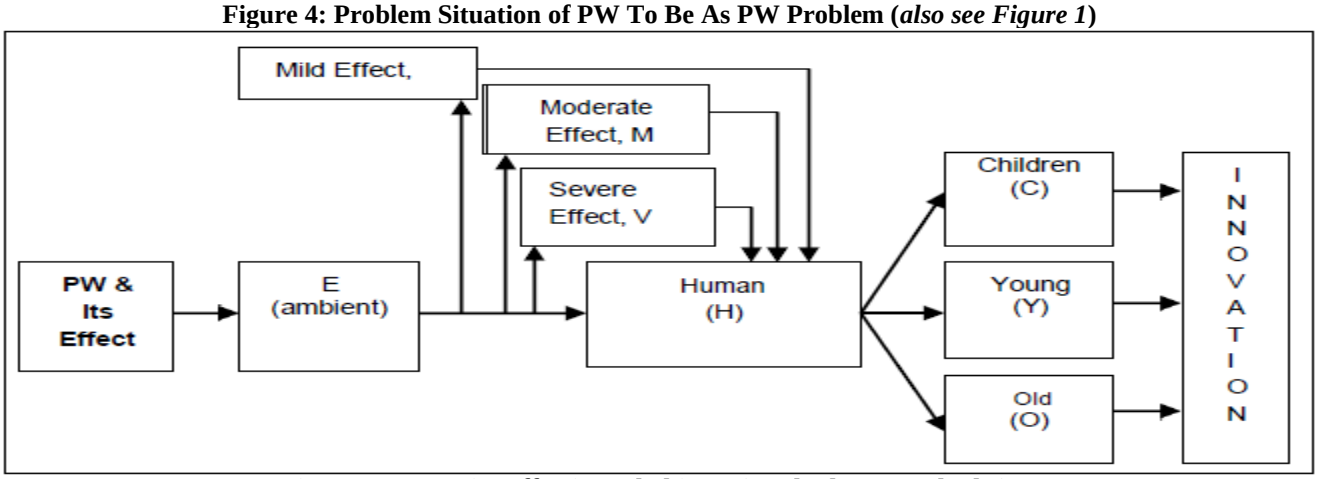

Figure 5: PW & its Effective Inhabitant (Method 1 & Method 2)

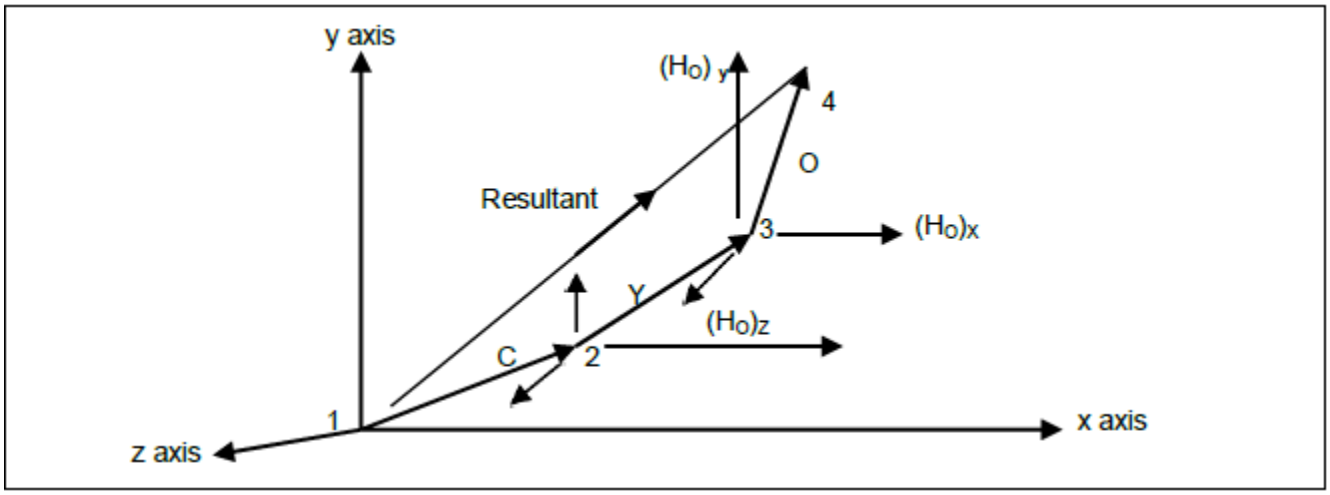

Figure 6: PW Effect Determination By Vector Analysis (3-dimensional co-ordinate axes system) (Method 2)

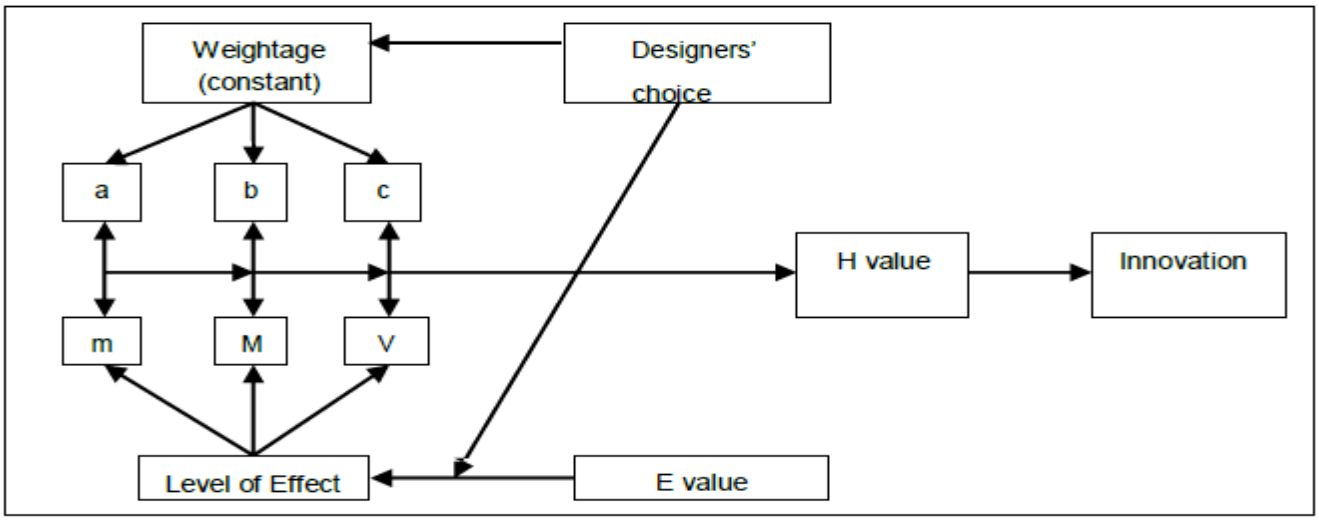

Figure 7: H value determination Leading to Innovation (Method 3) (also see Figure 5)

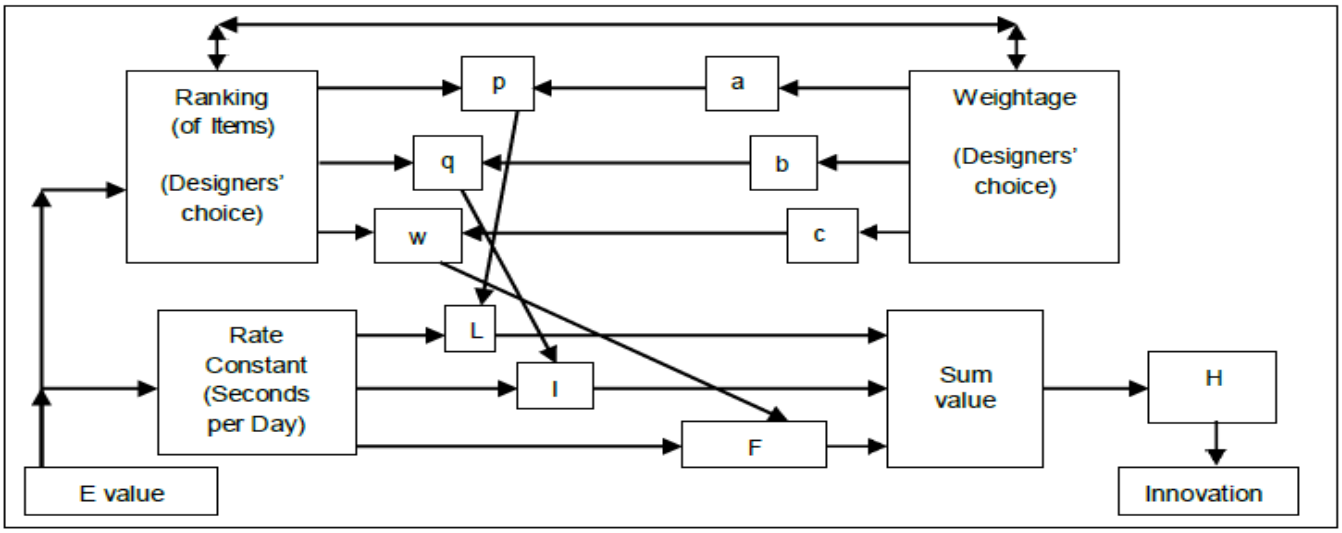

Figure 8: H value determination Leading to Innovation (Method 4)

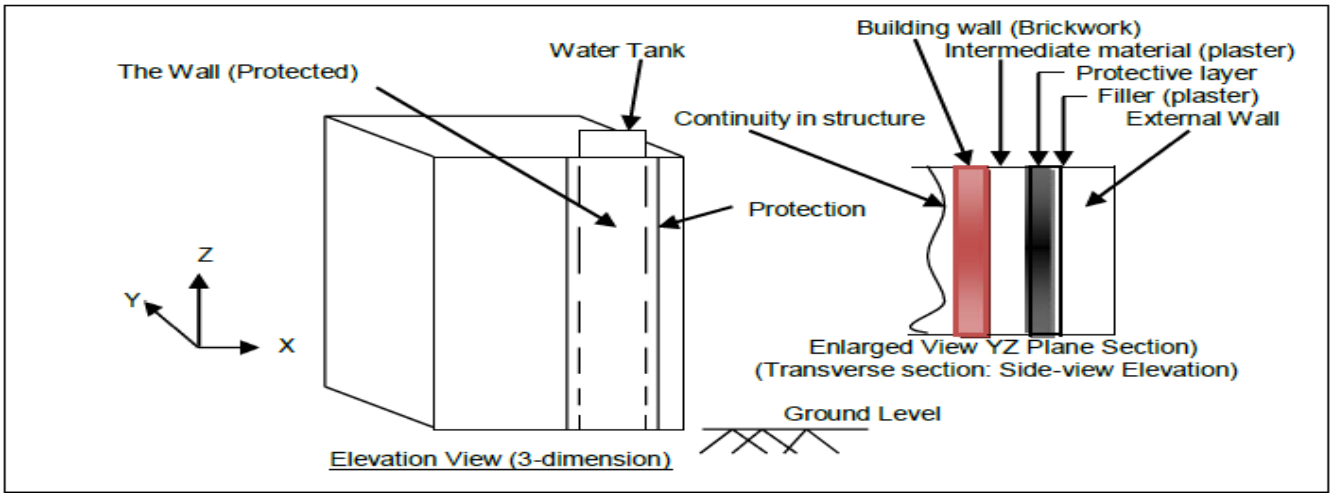

Figure 9: Habitat, Tank & The Wall (With Protection OfThe Innovation)

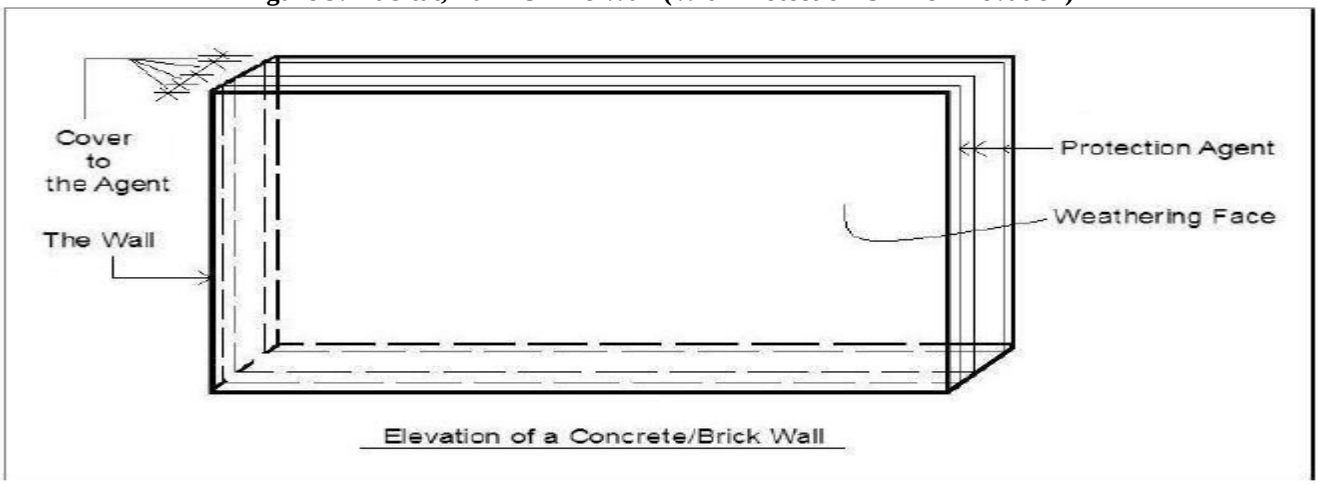

Figure9a: Provision Of Innovation As The Protection Agent On The Wall

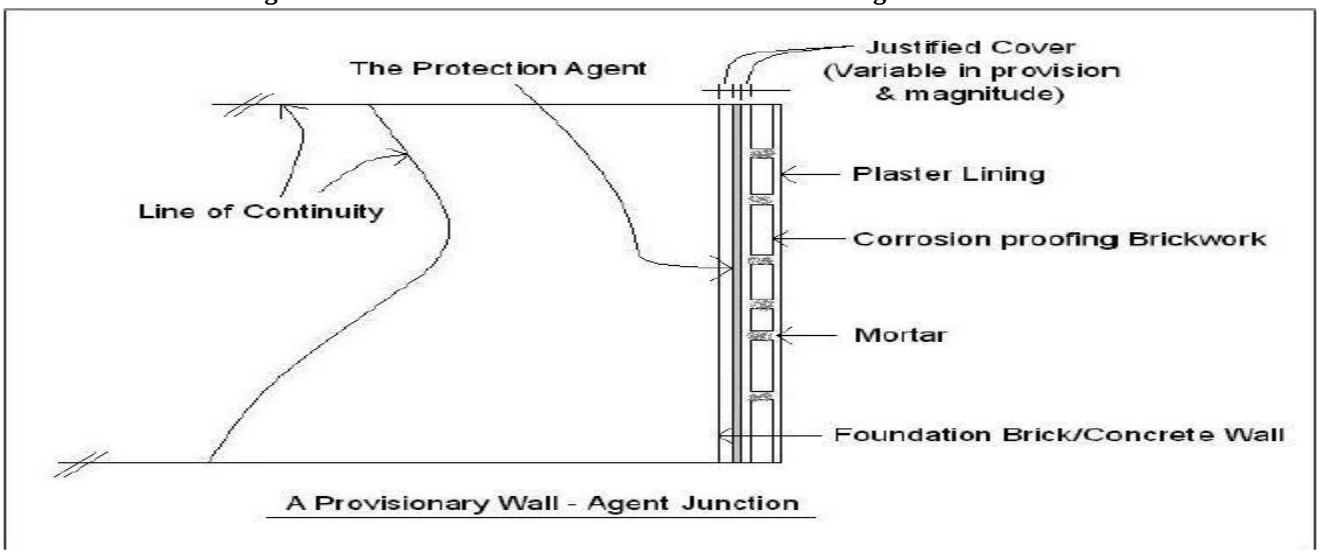

Figure 9b: 3-Dimension View of The Innovation Provision (Side-view of Figure 9a)

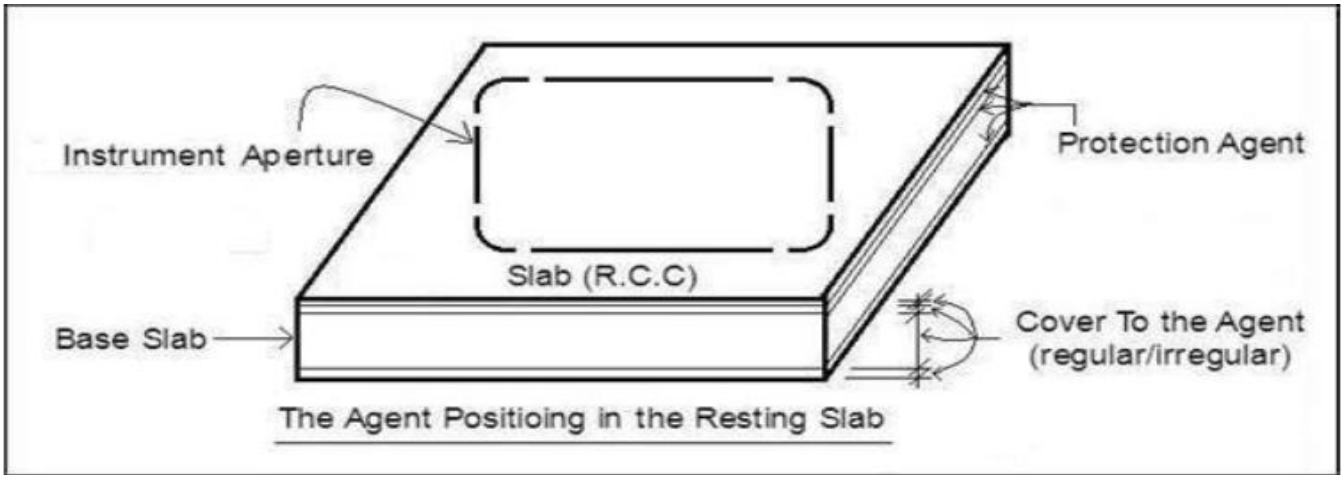

Figure 9c: The Innovation Provision In Base Slab Of Water Tank

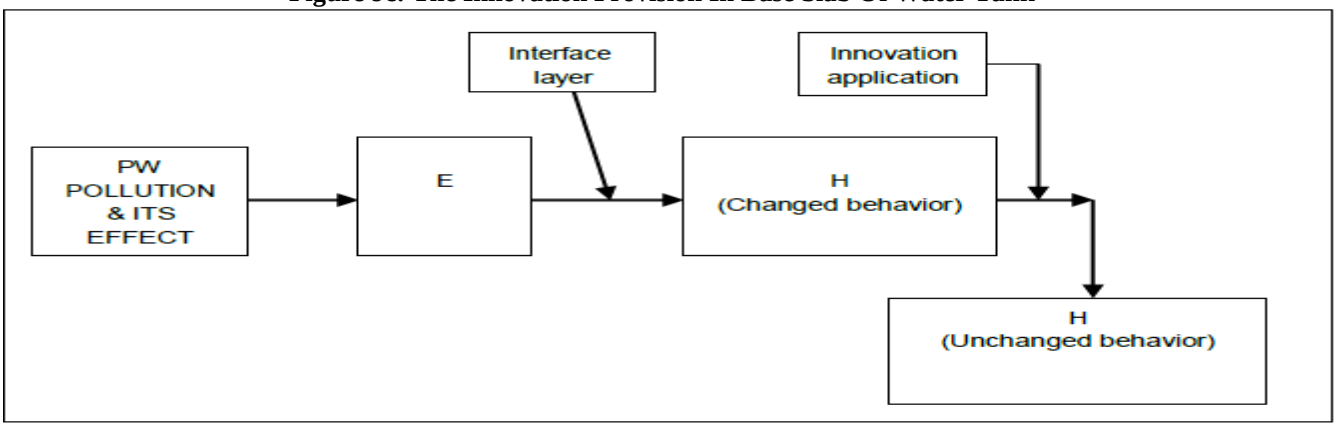

Figure 10: The Innovation Implementation Against The PW Effects To Protect Human Behavior Change

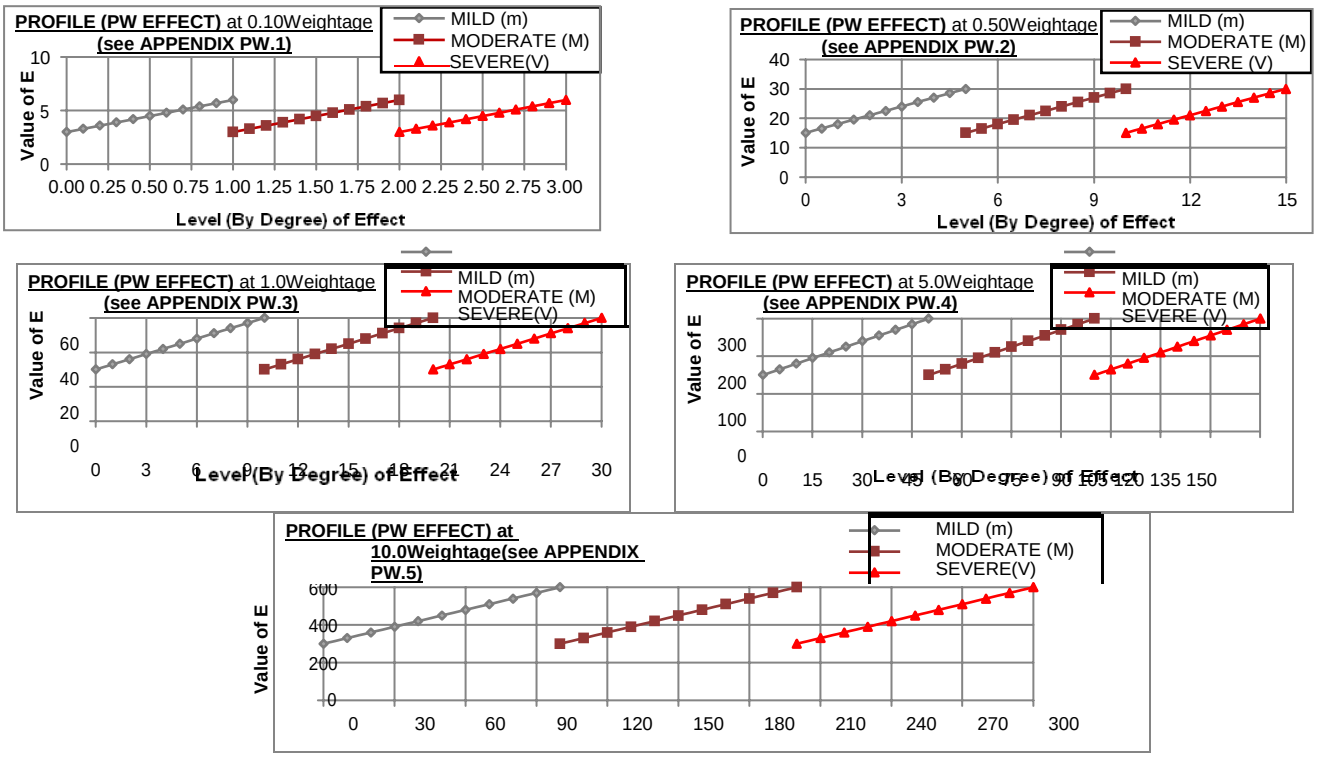

Figure 11: PW's Effect Profile Of To Innovation Solution (of the Appendices; Method 3)

APPENDIX PW.F: PW Formation Of Water Tank Structure (Illustrative Clips)

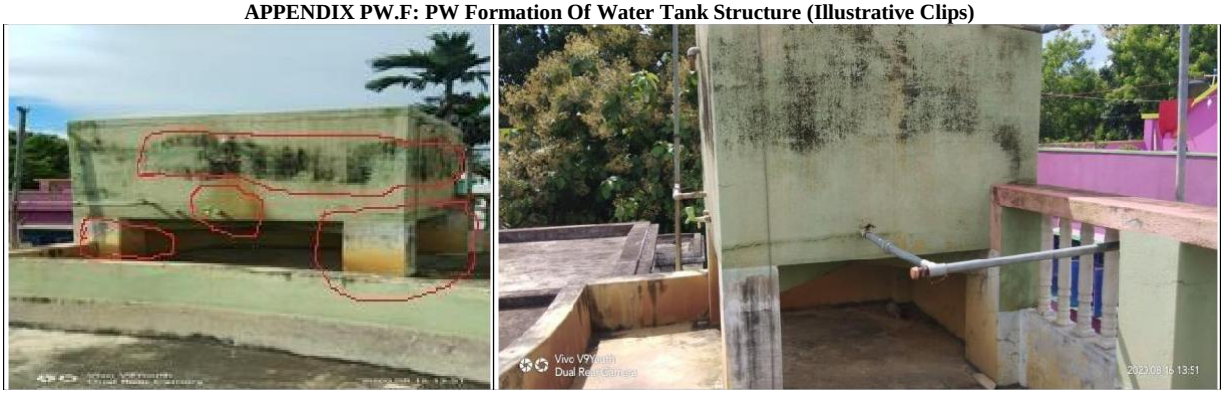

Table 1: Dimension & Wideness Of The Existence Of PW In Society^

PW As Pollution		
Impacted Society Under PW Pollution • **Immediate Society (OfPW)** • **Inherited Society (OfPW)**		
Inhabitant/Source	**Effect (Direct/Indirect)**	**Cause (Direct/Indirect)**
Genera l	Impacting Sources To Making The Pollution.	Causes Of Perceiving As Pollution.
Individual, in general	Experienced as unique individual.	Experienced as 'Unique' individual.
C: Children (8-12 years)	They feel & think kit-kat, chocolate etc. of their all-the-time companions as a resemblance of the appearance of PW. They often forget it, but relate PW (instantaneously at very higher speed) to making into their childish mind at the ages. This making affects the growing up mind of the times. Often, it leads to changing food habits, changing requests than earlier & alike of non-similar behavior after introduced with it. Effects are severe on repeated introduction again & again. **Behavior Characteristics (Changed):** Perceived changes, Rational changes & Long-term changes. **Example:** Food habit changes, Likes/Dislikes changes, Miscellaneous 'prospective' Growth Damages.	• Byconcern. • By thinkingindulgence. • By increasing competition oflife. • By life-style & socialstatus. • By natural growth ofmemory.

C: Children (12-20 years)	Exhibit the improved behavior over the earlier one, i.e., 8-12 years. Impact is severe, even at one glance. Effects on various things, from food habits to reading practices. Negation behavior is observed against various parental advices. Bad, damaging sights may open up at this stage by PW, resulting to penchant to bad tastes/ abstain wellness on parental. It is very important stage as the impact of PW gets decided on by the individual whether & how much to settle &permanent. **Behavior Characteristics (Changed):** Perceived changes, Rational changes & Long-term changes By Impaction by mild sensory touches. **Example:** Food habit changes, Likes/Dislikes changes, Miscellaneous 'prospective' Growth Damages.	• Byconcern. • Bythinkingindulgence (& ofthought). • Relatedness. • By increasing competition oflife. • By life-style & socialstatus. • By natural growth ofmemory.
Y: Youth (20-25 years)	They are quite mature. Still, the impact is at the nourishing stage at this stage also. Impacts by the earlier events by ages would settle down & become to maturing to be a completely changed behavior by tastes & all which are not expected by usual behavior, genre & expectation. **Behavior (Changed):** Perceived changes, Rational changes & Long-term changes By Impaction by sensory touches. **Example**: Food habit changes, Likes/Dislikes changes, Miscellaneous 'prospective' Growth Damages which are about to be firmly permanent.	• Byconcern. • Bythinkingindulgence (& ofthought). • Relatedness. • By increasing competition oflife. • By life-style & socialstatus. • By natural growth ofmemory.
Y: Youth (25-30 years)	It is considered to be matured stage. Impact of PW is seen scientifically. Inhabitant tries to find out the education behind such formation. Often, they	• By concern. • By thinking indulgence (& of thought).
	think about their house situation of the PW & considers how bad it is & tries to search on its solution. Although they forget it very soon, but the impacts would go enter into the justice judgment of the various things like supplier, mason, quality working, supply water quality, etc, resulting to treating the involved social peoples badly & become de-motivated over them. **Behavior (Changed):** Perceived changes, Rational changes & Long-term changes By Impaction by sensory touches of confirmation & check. **Example:** Food habit changes, Likes/Dislikes changes, Miscellaneous 'prospective' Growth Damages which are firmly permanent.	• Relatedness. • By increasing competition of life. • By life-style & social status. • By natural growth of memory.
Y: Youth (30-40 years)	They are quite affirmative over such formation & know very well about what actually happens & who might be responsible for it. But in exchange of these, they also develop changed behavior over the physical appearance, colors & wearing situations of the PW. They have some exclusiveness of similarity with the earlier, i.e., Youth(25-30 years). **Behavior (Changed):** Physico-Rational changes & Long-term changes By Impaction by sensory touches of confirmation & check. **Example:** Food habit changes, Likes/Dislikes changes, Miscellaneous 'prospective' Growth Damages which are quite firm & permanent.	• By concern of physical rationality. • By thinking indulgence (& of thought). • Relatedness. • By increasing competition of life. • By life-style & social status. • By natural growth of memory.
O: Older (>40 years)	They are found with the answer about PW by saying 'how much older the PW is' or 'how PW might have caused of' etc. etc. They also offer suggestive solutions. But with these, they develop a lesson which is as related to the society recognition as to be of their changed behavior. **Behavior (Changed):** Budgetary changes, Concept changes, Innovation excitation, Consultative helps & so on in addition to the effects so accumulated in by the earlier ages. **Example:**Symptomsofseverediseasesbythe changesoftheearlierdamages of the prior experiences of life withit.	• By concern of physical rationality. • By applying indulgence (& of thought). • Relatedness. • By expenses consideration. • By life-style & social status. (Inherited by PW exposures). • By natural growth of long-term memory.
Group (of all ages)	Experienced as a group member in a group. Weightage is cumulatively gained & the impacts gain the momentum of various dimensions, resulting to develop a resultant lesson in each of the earlier individual stages byages. **BehaviorCharacteristics(Changed):**BlendsoftheIndividualcharacteristics, in individual, & group implications of the discussion in thegroup. **Example:** Dimensional symptoms by degree of the blends in the change.	• By concern of physicality. • By thinking 'implied' indulgence (& of thought). • Relatedness. • By increasing discussion. • By life-style & culture. • By natural growth of the discussion by memory & brain.

^Table of Postulation (also, Propounding).

Table 2: PW Interface '*Postulatory*' Influences[%]

Inhabitant of the Interface	PW Interface Determination (By Spectrum Of Magnitude & Possibility By Range)			
	E		H	
	Interface Intensity (By Magnitude)	Interface Permeation /Penetration (By Possibility)	Interface Intensity (By Magnitude)	Interface Permeation /Penetration (By Possibility)
C	Low to Medium	Low	Medium to High	Medium to High
Y	Medium to High	Medium	High	High
O	Medium to Low	High	Medium	Medium

[%]Propounding and/or Postulation.

Table 3: Distribution Of PW In Society/Social Life

Target Sources / Socially Aware Individual/Group	Impacting Sources To Making The Pollution	Causes Of Perceiving As Pollution
Educated Individual/Group	(Perception By Educational Logic)+(Life-style)+(Brain growth to Creativity)+Value Recognition	Behavior change (By self-exploration & mobility of memory creativity & hunger of knowledge).
Uneducated Individual/Group	(Perception By Uneducational Logic)+(Life-style)+(Brain growth to Creativity)+ Value Recognition	Behavior change (By impaction by experience & learning)
Educated & Uneducated; Mixed & Blended in Group	Combination of the two, Educational & Uneducational	Behavior change (By Interchange & Exchange of Information by degree of intensity & else of the blending).

Table 4: Effect Determination On Individual, By Classified Age-Group (METHOD 1)

Inhabitant (Individual)	Constant	Attitudinal Effect (Individual)	PW Effect (Total)
C	a_1	H_{C1}	$C = a_1H_{C1}+b_1H_{C2}+e_1H_{C3}+\ldots+n_1H_{Cn}$
	b_1	H_{C2}	
	e_1	H_{C3}	
	n_1	H_{Cn}	
Y	a_2	H_{Y1}	$Y = a_2H_{Y1}+b_2H_{Y2}+e_3H_{Y3}+\ldots+n_2H_{Yn}$
	b_2	H_{Y2}	
	e_3	H_{Y3}	
	n_2	H_{Yn}	
O	a_3	H_{O1}	$O = a_3H_{O1}+b_3H_{O2}+e_3H_{O3}+\ldots+n_3H_{On}$
	b_3	H_{O2}	
	e_3	H_{O3}	
	n_3	H_{On}	

Table 5: PW Effect Determination By Vector Analysis (Method 2)

Effect of PW On Human			
Vector field system	Vector (magnitude)	Resultant Vector	Resultant of Component Vectors
Rectangular Co-ordinate system^	C	$\sqrt{C^2 + Y^2 + O^2}$	$C = \sqrt{(H_{C_1}^2 + H_{C_2}^2 + H_{C_3}^2)}$
	Y		$Y = \sqrt{(H_{Y_1}^2 + H_{Y_2}^2 + H_{Y_3}^2)}$
	O		$O = \sqrt{(H_{O_1}^2 + H_{O_2}^2 + H_{O_3}^2)}$

^Orthogonal.

Table 6: Classification Of PW Effect (Method 3)

PW Effect (Classified) & Its Ranges	
Kind of Effect	Range
Mild (m)	0-10
Moderate (M)	10-20
Severe (V)	20-30

Table 7: Unit Of Measurement Of Variables (Method 4)

Name of Variable	Unit
Rate Constant	Second per Day (Exposure Time)
Ranking	Number Per Item
Weightage	Percentage or Fraction (Unit-less)
PW Effect On E or H	Unit Value or Unit Value

APPENDICES (METHOD 3): APPENDIX PW

APPENDIXPW.A(GeneralFormat)^:_____

Sl.	Scale-effect By Degree, x									PW Effect, y (Total Effect)
	Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
	a (0.1-10)	m (0-10)	m*a	b (0.1-10)	M (10-20)	M*b	c (0.1-10)	V (20-30)	V*c	H= ma + Mb + Vc
0	0.10	0.00	0.00	0.10	10.00	1.00	0.10	20.00	2.00	3.00
1										
2										
3										
4										
5										
6										
7										
8										
9										
10	10.00	10.00	100.00	10.00	20.00	200.00	10.00	30.00	300.00	600.00

^Newton's Interpolation & Extrapolation is valid (Weightage=a, b & c). Please also see Figure 11.

APPENDIX PW.1 (Weightage=0.10): Scale-effect Determination of PW Effect & Correlation

Scale-effect By Degree, x									PW Effect (Total Effect), y
Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
a	m (0-10)	ma	b	M (10-20)	Mb	c	V (20-30)	Vc	H
0.10	0.00	0.00	0.10	10.00	1.00	0.10	20.00	2.00	3.00
0.10	1.00	0.10	0.10	11.00	1.10	0.10	21.00	2.10	3.30
0.10	2.00	0.20	0.10	12.00	1.20	0.10	22.00	2.20	3.60
0.10	3.00	0.30	0.10	13.00	1.30	0.10	23.00	2.30	3.90
0.10	4.00	0.40	0.10	14.00	1.40	0.10	24.00	2.40	4.20
0.10	5.00	0.50	0.10	15.00	1.50	0.10	25.00	2.50	4.50
0.10	6.00	0.60	0.10	16.00	1.60	0.10	26.00	2.60	4.80
0.10	7.00	0.70	0.10	17.00	1.70	0.10	27.00	2.70	5.10
0.10	8.00	0.80	0.10	18.00	1.80	0.10	28.00	2.80	5.40
0.10	9.00	0.90	0.10	19.00	1.90	0.10	29.00	2.90	5.70
0.10	10.00	1.00	0.10	20.00	2.00	0.10	30.00	3.00	6.00

Equation (Trend-line: Linear & Polynomial) At Weightage 0.10 (please see Figure11)

Effect Level, (x)	Linear Variability	R^2 Value	Polynomial Variability	R^2 Value
Mild (ma)	$y = 3x + 2.7$	$R^2 = 1$	$y = 6E\text{-}14x^2 + 3x + 2.7$	$R^2 = 1$
Moderate (Mb)	$y = 3x$	$R^2 = 1$	$y = - 6E\text{-}14x^2 + 3x - 2E\text{-}13$	$R^2 = 1$
Severe (Vc)	$y = 3x - 3$	$R^2 = 1$	$y = 3x - 3$	$R^2 = 1$

APPENDIX PW.2 (Weightage=0.50): Scale-effect Determination Of PW Effect & Correlation

Scale-effect By Degree, x									PW Effect (Total Effect), y
Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
a	m (0-10)	ma	b	M (10-20)	Mb	c	V (20-30)	Vc	H
0.50	0.00	0.00	0.50	10.00	5.00	0.50	20.00	10.00	15.00
0.50	1.00	0.50	0.50	11.00	5.50	0.50	21.00	10.50	16.50
0.50	2.00	1.00	0.50	12.00	6.00	0.50	22.00	11.00	18.00
0.50	3.00	1.50	0.50	13.00	6.50	0.50	23.00	11.50	19.50
0.50	4.00	2.00	0.50	14.00	7.00	0.50	24.00	12.00	21.00
0.50	5.00	2.50	0.50	15.00	7.50	0.50	25.00	12.50	22.50

0.50	6.00	3.00	0.50	16.00	8.00	0.50	26.00	13.00	24.00
0.50	7.00	3.50	0.50	17.00	8.50	0.50	27.00	13.50	25.50
0.50	8.00	4.00	0.50	18.00	9.00	0.50	28.00	14.00	27.00
0.50	9.00	4.50	0.50	19.00	9.50	0.50	29.00	14.50	28.50
0.50	10.00	5.00	0.50	20.00	10.00	0.50	30.00	15.00	30.00

Equation (Trend-line: Linear & Polynomial) At Weightage 0.50 (please see Figure11)

Effect Level, (x)	Linear Variability	R^2 Value	Polynomial Variability	R^2 Value
Mild (ma)	$y = 3x + 15$	$R^2 = 1$	$y = 7E\text{-}15x^2 + 3x + 15$	$R^2 = 1$
Moderate (Mb)	$y = 3x$	$R^2 = 1$	$y = 7E\text{-}15x^2 + 3x + 3E\text{-}13$	$R^2 = 1$
Severe (Vc)	$y = 3x - 15$	$R^2 = 1$	$y = 7E\text{-}15x^2 + 3x - 15$	$R^2 = 1$

APPENDIX PW.3 (Weightage=1.0): Scale-effect Determination Of PW Effect & Correlation

Scale-effect By Degree, x									PW Effect (Total Effect), y
Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
a	m (0-10)	ma	b	M (10-20)	Mb	c	V (20-30)	Vc	H
1.00	0.00	0.00	1.00	10.00	10.00	1.00	20.00	20.00	30.00
1.00	1.00	1.00	1.00	11.00	11.00	1.00	21.00	21.00	33.00
1.00	2.00	2.00	1.00	12.00	12.00	1.00	22.00	22.00	36.00
1.00	3.00	3.00	1.00	13.00	13.00	1.00	23.00	23.00	39.00
1.00	4.00	4.00	1.00	14.00	14.00	1.00	24.00	24.00	42.00
1.00	5.00	5.00	1.00	15.00	15.00	1.00	25.00	25.00	45.00
1.00	6.00	6.00	1.00	16.00	16.00	1.00	26.00	26.00	48.00
1.00	7.00	7.00	1.00	17.00	17.00	1.00	27.00	27.00	51.00
1.00	8.00	8.00	1.00	18.00	18.00	1.00	28.00	28.00	54.00
1.00	9.00	9.00	1.00	19.00	19.00	1.00	29.00	29.00	57.00
1.00	10.00	10.00	1.00	20.00	20.00	1.00	30.00	30.00	60.00

Equation (Trend-line: Linear & Polynomial) At Weightage 1.0 (please see Figure11)

Effect Level (x)	Linear Variability	R^2 Value	Polynomial Variability	R^2 Value
Mild (ma)	$y = 3x + 30$	$R^2 = 1$	$y = 4E\text{-}15x^2 + 3x + 30$	$R^2 = 1$
Moderate (Mb)	$y = 3x$	$R^2 = 1$	$y = 4E\text{-}15x^2 + 3x + 5E\text{-}13$	$R^2 = 1$
Severe (Vc)	$y = 3x - 30$	$R^2 = 1$	$y = 4E\text{-}15x^2 + 3x - 30$	$R^2 = 1$

APPENDIX PW.4 (Weightage=5.0): Scale-effect Determination Of PW Effect & Correlation

Scale-effect By Degree, x									PW Effect (Total Effect), y
Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
a	m (0-10)	Ma	b	M (10-20)	Mb	c	V (20-30)	Vc	H
5.00	0.00	0.00	5.00	10.00	50.00	5.00	20.00	100.00	150.00
5.00	1.00	5.00	5.00	11.00	55.00	5.00	21.00	105.00	165.00
5.00	2.00	10.00	5.00	12.00	60.00	5.00	22.00	110.00	180.00
5.00	3.00	15.00	5.00	13.00	65.00	5.00	23.00	115.00	195.00
5.00	4.00	20.00	5.00	14.00	70.00	5.00	24.00	120.00	210.00
5.00	5.00	25.00	5.00	15.00	75.00	5.00	25.00	125.00	225.00
5.00	6.00	30.00	5.00	16.00	80.00	5.00	26.00	130.00	240.00
5.00	7.00	35.00	5.00	17.00	85.00	5.00	27.00	135.00	255.00
5.00	8.00	40.00	5.00	18.00	90.00	5.00	28.00	140.00	270.00
5.00	9.00	45.00	5.00	19.00	95.00	5.00	29.00	145.00	285.00
5.00	10.00	50.00	5.00	20.00	100.00	5.00	30.00	150.00	300.00

Equation (Trend-line: Linear & Polynomial) At Weightage 5.0 (please see Figure11)

Effect Level (x)	Linear Variability	R^2 Value	Polynomial Variability	R^2 Value
Mild (ma)	$y = 3x + 150$	$R^2 = 1$	$y = 3x + 150$	$R^2 = 1$
Moderate (Mb)	$y = 3x$	$R^2 = 1$	$y = 3x + 2E\text{-}12$	$R^2 = 1$
Severe (Vc)	$y = 3x - 150$	$R^2 = 1$	$y = 3x - 150$	$R^2 = 1$

APPENDIX PW.5 (Weightage=10): Scale-effect Determination Of PW Effect & Correlation

Scale-effect By Degree, x									PW Effect (Total Effect), y
Mild Effect Determination			Moderate Effect Determination			Severe Effect Determination			
a	m (0-10)	ma	b	M (10-20)	Mb	c	V (20-30)	Vc	H
10.00	0.00	0.00	10.00	10.00	100.00	10.00	20.00	200.00	300.00
10.00	1.00	10.00	10.00	11.00	110.00	10.00	21.00	210.00	330.00
10.00	2.00	20.00	10.00	12.00	120.00	10.00	22.00	220.00	360.00
10.00	3.00	30.00	10.00	13.00	130.00	10.00	23.00	230.00	390.00
10.00	4.00	40.00	10.00	14.00	140.00	10.00	24.00	240.00	420.00
10.00	5.00	50.00	10.00	15.00	150.00	10.00	25.00	250.00	450.00
10.00	6.00	60.00	10.00	16.00	160.00	10.00	26.00	260.00	480.00
10.00	7.00	70.00	10.00	17.00	170.00	10.00	27.00	270.00	510.00
10.00	8.00	80.00	10.00	18.00	180.00	10.00	28.00	280.00	540.00
10.00	9.00	90.00	10.00	19.00	190.00	10.00	29.00	290.00	570.00
10.00	10.00	100.00	10.00	20.00	200.00	10.00	30.00	300.00	600.00

Equation (Trend-line: Linear & Polynomial) At Weightage 10.0 (please see Figure11)

Effect Level (x)	Linear Variability	R^2 Value	Polynomial Variability	R^2 Value
Mild (ma)	$y = 3x + 27$	$R^2 = 1$	$y = - 4E\text{-}15x^2 + 3x + 27$	$R^2 = 1$
Moderate (Mb)	$y = 3x + 2E\text{-}13$	$R^2 = 1$	$y = 3x - 2E\text{-}13$	$R^2 = 1$
Severe (Vc)	$y = 3x – 27$	$R^2 = 1$	$y = 4E\text{-}15x^2 + 3x – 27$	$R^2 = 1$

AUTHORS PROFILE

Mr. Prasanta Biswas, presently working as Assistant Professor in the Department of Civil Engineering, Global Institute of Management & Technology, G.I.M.T, West Bengal, India, has served several years in teaching industry with enriching expertise, workshops & exposures. He completed his Masters Degree (Environmental Engineering) in 2006 from Jadavpur University Kolkata West Bengal. He is a Reviewer of the Journal "Institution of Civil Engineers" (ICE), UK in which he has reviewed papers of concern of Civil Engineering. He has 01 publication & 12 publications in the respective Journals of National & International repute. He is used to attend various programs (like FDP, Swayam, Webinar, & etc.). He likes to do research in the field of Soil- Water Interaction, Particle Mechanics, Aerosol Engineering.

Mr. Atanu Paul, Final year (Batch 2020) 8th Sem B.Tech student of Civil Engineering Department, Global Institute of Management & Technology, G.I.M.T, West Bengal, India. He is confident & sincere to his duty & works. He is active member of publication.

Jayanta Kumar Karmakar, Civil Engineering Department, 4th Semester Student (B.Tech., M.A.K.A.U.T **Roll No. 25901318132**), Global Institute of Management & Technology, G.I.M.T, (Maulana Abdul Kalam Azad University Of Technology, M.A.K.A.U.T), West Bengal, India. E-Mail: karmakarj712@gmail.com.

Sohel Sk., Civil Engineering Department, 4th Semester Student (M.A.K.A.U.T **Roll No. 25901319040**), Global Institute of Management & Technology, G.I.M.T, (Maulana Abdul Kalam Azad University Of Technology, M.A.K.A.U.T), West Bengal, India. E-Mail: sohelsk.0225@gmail.com.

Biltu Mondal, Civil Engineering Department, 4th Semester Student (B.Tech., M.A.K.A.U.T **Roll No. 25901318133**), Global Institute of Management & Technology, G.I.M.T, (Maulana Abdul Kalam Azad University Of Technology, M.A.K.A.U.T), West Bengal, India. E-Mail: biltumondal955@gmail.com.

Sujay Banerjee, Civil Engineering Department, 6th Semester Student (B.Tech., M.A.K.A.U.T **Roll No. 25901318017**), Global Institute of Management & Technology (Maulana Abdul Kalam Azad University Of Technology, M.A.K.A.U.T), West Bengal, India. E-mail: sujaybanerjee24@gmail.com.

Nabamita Sen, Civil Engineering Department, 4th Semester Student (B.Tech., M.A.K.A.U.T **Roll No. 25901319088**), Global Institute of Management & Technology (Maulana Abdul Kalam Azad University Of Technology, M.A.K.A.U.T), West Bengal, India. E-mail: donasen97@gmail.com.

Binka Mondal, Civil Engineering Department, 2nd Semester Student (Diploma, W.B.S.C.T.E **Roll. DGIMCES1 No. 10009307**), Global Institute of Management & Technology (West Bengal State Council of Technical Education, W.B.S.C.T.E), West Bengal, India. E-mail:binkamondal906@gmail.com.