Technological Forecasting & Social Change 155 (2020) 120029

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Coupling multilevel perspective with causal layered analysis on non-reflexive societies the case of socio-technical system of car fuel in Iran

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ARTICLE INFO

Keywords:
The Multilevel Perspective
the Causal Layered Analysis
Modernized-traditional society
Deconstruction
post structuralism
Action Learning research workshop
car fuel
air pollution
Iran

ABSTRACT

This paper starts with a literature review that shows there is a clear difference between the literature of multilevel perspective with original focus in north Europe with reflexive governance and the new literature which documents the sustainability transition in non-reflexive societies. My argument is that the literature with emerging focus does not rely on the grand theories of social change in contrast to the literature with original focus. Based on this argument, I raise two questions: 1- what does MLP lack to study transitions in these societies. 2- What is the normative stand upon which the sustainability transition should be based. To address these questions, the paper used a post-structuralist tool box in the process of an action research workshop with a CLA structure. The case study was that of the car fuel socio-technical system in Iran. The paper concludes two points: 1- The coupling of Multilevel Perspective and Causal Layered Analysis can find facts which would have been hidden if the research were confined to the MLP framework. 2- Reflexiveness calls for societal platform to disclose and project discursive struggles and facilitate the inclusion of others. This is absent in vast part of developing countries.

1. Introduction

Nobody can miss the fact that the geographical focus of the post-1994 literature, which started to document case studies on socio-technical transition, was majorly on North European (Denmark, Germany, Netherlands, Sweden, Norway and England) societies with strong culture of civil green movements, balanced social-democratic states and organized markets. This geographical focus is now being partially offset by a quite opposite turn towards the regions with radically different institutional settings that we call "developing countries" (Hansen, 2018; Wieczorek, 2018), or "global south" (Alhborg, 2017). Both expressions refer to a rough amalgam of non-western societies with diverse level of economic growth, political structures and specific cultural and religious backgrounds. In this paper, for easy reference, the former focus is called the original focus and the latter the new emerging focus.

This paper is designed to contribute to the emerging focus of transition literature by putting the concept of “cultural meaning of change/innovation” in the context of developing countries. Utilizing the post-structuralist tool box, the paper introduces a theoretic-methodologic adaptation of the multi-level perspective (MLP) built as a heuristic device to apply to this context. Both “developing countries” and “Global South” are relational and contested terms. The paper chooses to place both under the conceptual umbrella of "non-reflexive societies", in order to draw the attention of the readers to cultural-cognitive institutions.

The paper holds this view that the dominant approach in the emerging literature fails to follow the footsteps of the original strands of transition management and MLP, which has always been akin to engage with social theory. While it has, more or less, recognized that the transition theories cannot be applied to the context other than its birth place without adaptation or at least reservation, the new emerging literature is not curious enough to search for the in-depth roots at the epistemological and ontological levels. This paper addresses this research gap and the crust of this argument consists of three points that will be further explained in detail:

First: The original MLP has basic essentials to analyze ex-post the non-governed past transitional processes of socio-technical systems in the west. It also is devised to manage four transition pathways based on *a priori* accepted normativity of environmental sustainability in the societies that reflexive governance prevails.

Second: As a universal middle range theory, the original MLP can only describe the phenomenological outlines of transitions (Geels, 2019). To make it relevant to the specific context of the non-reflexive societies, and to conceptualize more detailed activities and mechanisms at the local level, it needs to cross over to other disciplines of social theory with critical tenant, which help depict the possible scenarios without repeating and reproducing the present.

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https://doi.org/10.1016/j.techfore.2020.120029
Received 17 May 2018; Received in revised form 6 March 2020; Accepted 12 March 2020

Third: The post-structuralist tool kit (Inayatullah S., 1998; Derrida, 2016), complements the MLP heuristics since it reaches beyond the normativity and extends out to the cultural-cognitive layer of the societies. It, therefore, unveils what these societies, normally, dodge to put into the public discourse.

The paper argues that the MLP in transition literature needs to couple with post–structuralism as the method to examine the failures of transitional pathways in the aforementioned societies. This coupling would provide a useful methodological heuristic tool for comprehensive diagnostic research. It helps to understand and to explain the regime resistance against sustainability policies when it is based not only on discovering of the existing latent norms but also on problematizing and de-constructing them to create new meaning.

After this introduction, a concise literature review of transition management and MLP in non-reflexive societies will be presented. Then, the paper proceeds to have two parts: The first part is devoted to the methodological description of a hybrid framework constructed by bridging MLP and the Causal Layered Analysis (CLA). In the second part, the paper applies the framework to a case study, the car fuel socio-technological system (regime and landscape) in Iran during a action learning/research workshop. The paper concludes with discussion and conclusion.

1.1. Part 1: Literature review

At the first glance, the engagement of the MLP to modernization theory looks to be indirect in relation to very different, yet, all modern social ontologies presented by seven knowledge theories of social change: rational choice, evolutionary theory, structuralism, interpretativism, functionalism, conflict theory and power struggle and relationism (Geels, 2010). Yet, in a careful examination, the real contribution of the social modernization to MLP proves to be quite immediate, straightforward and indispensable: the dynamics and interactions among the different levels of analysis, niches and regimes and between regimes and the landscape are substantially differentiated by the degree of their “structuration" that is, “the relation between structure and agency,” thanks to structuration theory coined by Anthony Giddens (Giddens, 1994). Several authors have used this conceptualization to explain that actors are not only embedded in certain structures, but they reproduce the same structures.

The MLP also uses Beck and Giddens's notion of reflexive modernization, mainly to show the contingency and complexity of transitions and governance (Grin, 2008). Grin argues for complex view of governance by drawing upon Beck's concept of second Modernity and maintains that transitions to sustainable development have to be understood as contested and as taking place in a pluralistic society, wherein actors are constantly adjusting their positions and are aware of the politicization of side effects (Grin, 2010:230). Elsewhere, Rotmans and Kemp (2008) claim that transition management is a strategy of reflexive modernization. It acknowledges possible risks and rebound effects from system innovations, which can be anticipated and countered (Rotmans, 2008)

Drawing on social theories and North Europe social contexts, the original MLP has developed two sets of transition research:

One: The historical studies conducted ex-post on the transition pathways which were ungoverned (Geels F. W., 2011),

Two: The studies on the current system innovations and sustainability transition pathways based on territories with governance.

In both studies, transition is a gradual collective sense making process conducted by the public to share their experiences and experiments and expectations. It deals with image and metaphor and symbols carried by discourse and shared intersubjectively. The public sphere is an important domain for the legitimation of technological innovations. It functions as a core element in modern democracies, enabling citizens to access information, observe decision-makers, form judgements of societal developments, and articulate their views and opinions (Jansma, 2019).

MLP discerns multiple roles for cultural institutions at different levels of the system (Geels and Schot, 2007). Accordingly, "it plays as (exogenous) deep structural trend at the landscape level. It does as specific symbolic meanings at the regime level" (Verhees and Geels, 2011:913). Cultural legitimacy, at the niche level, refers to a produced narrative by the forerunners that niche development is desirable.

What the original transition scholars (2005b) have contributed to the subject of cultural meaning of technology was the principle of co-evolution of cultural meaning, the consumption patterns and the technological innovation processes during the process of the emergence and development of technologies such as car manufacturing in the United States (1830-1930), water engineering and distribution in the Netherland (1830-1950) and nuclear energy (1945-1986) in the Netherland. (Geels F., 2005; Geels F. W., 2011). As the MLP literature acknowledges, these co-evolutionary patterns produce dissimilar speed and rate of success of transitions in different locations and regions (Geels et al, 2018) and create varying patterns of social enactments of transition (Geels et al., 2016) as the first set of original studies. Yet, the geographical scope of this research never stepped out of the post-industrial world. All cited papers rely on the duration of 60-70 years of social experimentations and learning by collective dialogues, public debates and class struggles in western societies.

Geels and Verhees (2011) have systematically analyzed the dynamics of culture and the mechanisms through which it exerts influence. Inspired by this diversity, this paper suggests an evolutionary process that can have different steps. In the initial step, we observe culture determinism based on a seamless web of top-down relationship pays little attention to agency, information and free choice. Culture exerts a top-down deterministic influence on relationship between deep structure of the landscape and the regime, making it looks like a unitary and internally coherent society. This condition changes as the role of agency and its activism grows and gains momentum to the steps in which the agency enters into the process of argumentative sense-making around specific issues and gets involved into discursive struggle with others on public stage.

The literature with original focus has clarified the relationship between the process of sense making and the sustainability transition. It posits that that transitions can be seen as an expression of what Beck and others have called reflexive modernization (Grin, 2008).

What this paper aims to establish here is to clear the relationship between non-reflexive societies and sustainability transitions. By non-reflexive society, I mean the construct that connotes with non-learning, non-experimenting process of leading society's institutions towards sustainability. Relying more on regulations, chastisement and control instead of raising awareness and self-regulative arrangement is quintessential feature of non-reflexive society. In this context, the machine apparatus to take action is not governance (a nexus of local micro webs of self-regulatory arrangements), but big central government, which controls sustainable transition more like a central planning process.

Therefore, non-reflexive society means the society that skirts completely or partially to embrace the advanced governance models and avoids providing the requisite of social-political institutions that take on many of these challenges in more participatory and deliberative ways. That can happen even with the society that has already got acquainted or fully embraced the material or rather techno-economic dimensions of modern life. Drawing on the distinction Voss and Kemp have made between first order modernity and second order modernity (2006) and their definition of pre-modern society. These societies embrace selectively some features of modernity while resisting to reflect critically upon and change their social surroundings. They create a new condition which is called either "non-modern (Latour, 1992)" "quasi-modern (Hwang, 2015)", "compressed modern (Kamali, 2001)", or "interrupted modern" (Chambers, 2008). Are we dealing with pre-modern or traditional societies? Giddens assures us that we are not.

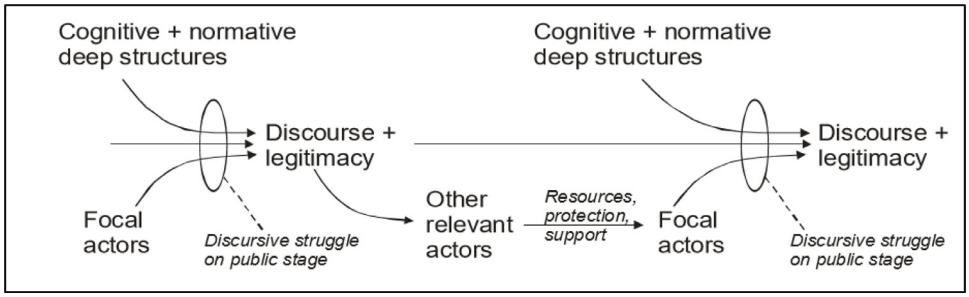


Fig. 1. The process of sense making in the societies with the institutions aligned with sustainability transitions inspired by Geels and Verhees (2011)

"Globalization and second modernity have enveloped the whole world" and "globalization has made the term 'developing societies' redundant" (Giddens, 1994). Moreover, Beck et al. (2003) points out that "the nations of Africa, Asia and South America are subject to the same contemporary disruptive influences of modernization" or grand challenges, despite the fact that, "they never experienced first modernity" (Beck et al., 2003):7.

However, this untimely interface with the imported modernization along grand challenges has brought dramatic repercussions for these societies whose cognitive–cultural institutions were not ready to accommodate. Therefore, they emerge as non-reflexive modernized societies whose salient feature is the non-alignment of cognitive-cultural and economic-technological institutions.

If we return to the process of collective sense making of Geels and Verhees (2011), we can compare the two processes of sense making in the society with technical-economic and cultural-cognitive institutions alignment (Fig. 1) and societies with no alignments (Fig. 2). In the first one, the sense making process encompasses multi-stakeholders and explicit public discourse to build consensus.

Fig. 2 illustrates one-way top-down communication between the authorities and the society without explicit feedbacks.

Although the original literature has already pointed to the lack of reflexivity as one of the transition failure (Rohracher, 2012), this subject has not been the subject of the emerging literature.

In fact, the new emerging literature discussion on the cultural meaning of technology was limited to foreignness of the source of technology and not the relation between technology and the society. Some hold the technology legitimate as the innovations has traveled to the rest of the world by the West (Jolly et al., 2012). These studies lean towards theories of growth, convergence and catch-up to justify the inbuilt legitimacy of transferred technology. There are other scholars, drawing on northern neo-colonialism (Amars, 2017), political ecology (James, 2011) and Foucauldian power-discourse analysis (Tyfield, 2014) which are critical of both; it is the source of technology which legitimizes or de-legitimize "technology". Neither of them posits any role for the actors or structures within developing societies. They presume that they are just passive recipients of what the western world would send, be either blessing or curse.

Having all considered, the paper continues to answer two specific questions regarding the literature with emerging focus:

1 Without relying on the theoretical background of governance, which points in terms of facts are missing in the literature of emerging focus.
2 What is the relationship between non-reflexive societies and sustainability transition in terms of normative stands?

2. Part 2: research method

To answer these two questions, the paper calls for a return to the basics and counterfactually reflects on the lack of reflexivity in the process of modernization. Focusing on the cultural meaning of "technology" and the question of legitimacy of transition as a practical remedy, it suggests making theoretical-methodological crossover to post structuralism. As put before, "Transitions are deliberative social learning processes". The co-evolution between the techno-economic institution and cognitive cultural institution makes possible the formation of friendly polity, policy and politics of transitions. What would have happened if this alignment had not existed? Are we dealing with something that is omitted, covered or latent in non-reflexive societies? The post-structural approach looks at what is "missing" from particular images of the future. From this perspective "politics is acknowledged and self-interest disclosed through the research process" (Inayatullah S., 2002 a), which facilitates a more robust approach to designing a preferred future.

Snowden (2010) cited in Dick, 2012 identifies action research and narrative techniques, as appropriate methodologies for research in these complicated situations. Action learning can perform in the classroom and in the field.

Sohail Inayatulalh has developed future-oriented version of action research and action learning (Zuber-Skerritt, 2012) based on post-structuralist methodologies. There are already some endeavors

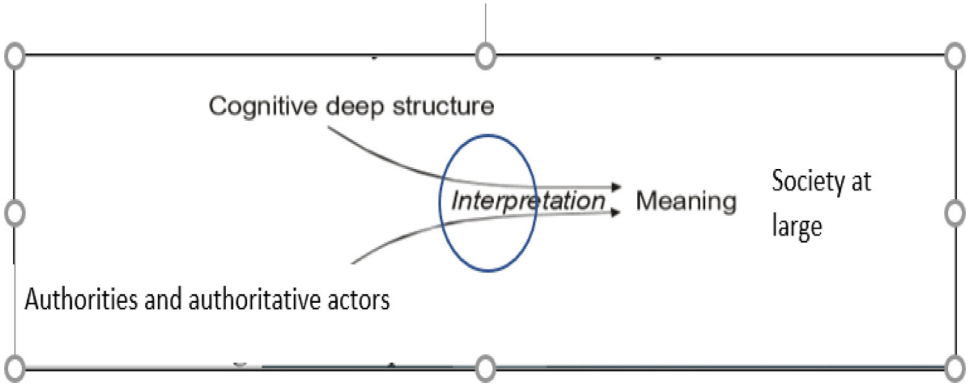


Fig. 2. The process of sense making in non-reflexive societies

suggesting a bridge between MLP and post-structuralism (James, 2011), (Melissa Jackson, 2014). What is different about the methodology in this paper is that it uses the causal layered analysis (CLA) and "anticipatory action learning" of Inayatuallh with employing the post-structuralism of Derrida's de-construction to reveal what is taken for granted or missing in the process of public sense making. Causal Layered Analysis (CLA) (Inayatullah S., 2009) is available In relation to drawing out and challenging worldviews and perspectives on the future. CLA is a framework used to deepen perspectives and investigate underlying worldviews, and thereby enables greater depth of analysis. Like MLP, CLA takes a layered perspective and helps to frame complex societal issues. The four layers are described:

1 The litany of the day-to-day future,
2 The systemic causes of events, issues, problems,
3 The cultural, or worldviews, which shape our view of the world and that underlie the two surface layers, and
4 The deep (often unconscious) stories, or metaphors, which underpin societal foundations.

The novelty of this paper is that, it proceeds to reach to Derrida's *Differance* and deconstruction strategy (Derrida, 2016) while using CLA in action learning workshop.

How does CLA help transition literature with emerging focus to disclose the missing part of socio-technical systems? My argument is that putting litany layer aside, the CLA starts with the layer of systemic causes that can be equivalent to the description of socio-technical regime and its institutional dynamics and structuration in two parts of production and consumption. The layer of worldview or discursive analysis corresponds to the analysis of how the process of production and reproduction of sense making takes place. And, in the layer of metaphor, one may analyze and understand the cultural institutions in the land scape. See Table 1.

3. Part 3: The case study: Anticipatory action learning workshop

On late Thursday, November 15, the government took the people by surprise by announcing a gasoline rationing plan and price hikes, without prior notice, to begin at midnight on Friday. According to the new plan, vehicles for private use were restricted to 60 liters (16gal) of fuel monthly, while the price of petrol jumped 50 percent to 15,000 Iranian rials ($0.13 at open market rates) per liter. Any fuel purchases in excess of allotted rations incurs an additional charge of 30,000 rials ($0.26) per liter. Iranian President Hassan Rouhani has defended this shock therapy as a move to cut petrol subsidies to fund support for Iran's poor and help shift resources from the rich 25 percent citizens to the rest.

Iran is one of the countries with the cheapest gasoline price and the worst air pollution in big cities, endangering the health of people. In November 2019, one third of school days in some big cities were canceled due to air pollution. The subsidy drawn from the gasoline price hikes allocated to compensate the low-income families looks a sound step aligned with environmentally sustainable transition. This policy, announced a few days following the announcement of the price increase, failed to be welcomed by non-government organizations and the middle and working classes.

Thus, the price hikes were met with widespread and mostly violent protests across the country, mostly in the poor suburban neighborhoods and shantytowns. As a results, many buildings, cars, banks and shops were attacked, disrupting the normal flow of business and traffic. Internet connection was cut off by the state for security reasons, leading to more loss for businesses, which was already under strain due to the US sanctions and political uncertainties. Hundreds of people are said to have lost their lives as a result of shootings and clashes and the death toll is yet to be formally announced by the authorities.

3.1. Iranian landscape of car fuel industry

Iran started 20th century with a constitutional revolution, seeking to institutionalize the rule of law. That means its first experience with Modernity was through an attempt to bring about radical change in the political and cultural institutions. However, this experience was short-lived and soon the dictatorial political leadership prevailed with the advent of Reza Shah. Since then, whenever the economic and technical infrastructures and institutions tended to rapidly modernize, the political and cultural-cognitive institutions failed mostly to catch up with the modernization (Shayegan, 1997). Therefore, the Iran society is a non-reflexive modernized society.

Iran, a developing society with around 83 million of population, began a rapid industrialization process in 1960-1978 (Karshenas, 1990), followed by a fast urbanization after 1978. The changes have brought about modern institutions and life style for millions of urban inhabitants (currently more than 75% of the population), which have crowded cities and gave rise to air pollution, traffic congestion in Tehran (the capital with more than 10 million of population) and the other major cities (Naddafi, 2012; Amirreza Talaiekhozani, 2017; Kakoui A, 2012).

Underlying this fast tract modernization with grave environmental repercussions lays the macro-societal dynamics, which stems from Iran's historical path and geographical features (linking central Asia to Middle East) and its resourceful natural endowment (the second in the proven natural gas and the fourth in oil proven reserves) (Tribune, 2017). Economically, the most important source of foreign currency is oil export, whose proceeds are gained by the state and recycled into Iranian economy. This fact impacts the whole society with its all economic, societal, political and international dimensions. That makes this context double carbon lock in the deepest and broadest way with three features:

First: The State is the main player in the economy. Market prices are distorted by the state intervention through various subsidies and customs' tariffs and barriers. It sometimes may result in the so-called Dutch disease (Karamelikli, 2017), which affects the technological variety (leaning towards rent seeking behavior at the expense of technological novelty) and technological selection (non-economical).

Second: The state is far less financially dependent on tax revenues from the society. Oppositely, different social classes seek a share of oil rent through different formal and informal channels (Wegenast, 2016). That encourages industrial patrimonialism; a hierarchical ordering of the industrial firms with state, military, finally parastatals and a weak presence of private ownership along with the virtual absence of civic partnership.

Third: Fanned by tense international relations, the discourse of

Table 1
The comparison between MLP and CLA

	Layers of CLA framework	Levels of Multilevels perspective framework
1	Litany	
2	Systemic causes of events	Socio-technical regime (Production and demand sides without cultural meaning)
3	Worldview and discourse analysis	Process of cultural meaning making inside the socio-technical regime
4	Metaphor	Deep cultural structure and cognitive institutions in the landscape

hyper-independency has grown as the dominant policy discourse in the industrial and agricultural sectors for the last 40 years (Miremadi, 2012). There are two other competing discourses that have affected the public policy making process from time to time, but never succeeded to dethrone the dominant discourses: that of economic growth and second that of environmentalism (Fadaee, 2012).

The absolute dominance of hyper-dependency discourse has not been possible were it not for the first and second features of Iran social dynamism. That is, the viability of the discourse of hyper-independency is owed to the ability (feature 1) and the will (feature 2) of the state to cover the productivity gap between the global and national level of productivity by various policy instruments such as customs tariffs and barriers and energy subsidy.

As a result of these three features, the industrial infrastructure is big, hierarchical, non-productive and the economy is deeply oil-based and carbon lock-in in terms of its main revenues, the nature of state-society relationship and the dominant discourse. Using (Lovio and Kivimaa, 2012) expression of double lock-in and broadening it at the national level, one can conclude that this country, is not only vulnerable to the carbon lock-in, but it is rather double or triple locked-in in terms of techno-economic and cultural-cognitive institutions.

This deep institutional carbonization impacts the institutional logic of the socio-technical systems of car fuels on a regular basis and, as explained later, it shapes the expectation and behaviors at the regime and niche levels.

The state is an omnipresent actor in both the car industry and oil refining, which produces car fuels. It also plays a major role in the management of the demand, determining the price of fuel and designing different schemes.

The chronic international economic sanctions against Iran that have existed for many years had an impact on the form of steady pressure from landscape on this regime from two aspects: the first aspect is the deprivation of state-of-the-art technology. Cars are built with outdated and inefficient technology that involves a high rate of fuel consumption and the emission of GHG at a rate multiple times more than global standard (Barazandeh and Rafieisakhaei, 2016). A case survey indicates that the overall average for the contribution to CO2 emissions in private cars, motorcycles, buses, and taxis were 26372, 1648, 1433 and 374 tons per day, respectively. It also showed that the urban transport operation consumes an estimated 178 and 4224 million liters of diesel and petrol per year, respectively, that released about 10 million tons of CO2 (Kakoui A, 2012) Fig. 3.

Nowadays in the transportation fleet, there are 19 million cars. Iran daily consumption of gasoline is more than 80 million liters and it has even reached 105 million liters in peak days. Fig. 4 compares Iran's gasoline price to that in 25 other countries. This shows that gasoline in Iran was ranked as the second cheapest before the recent price hike.

Fig. 5 shows why the Iranian people do not feel the price that cheap. In fact, the burden of gasoline price on Iranian motorists is felt heavier than on those in Norway, Germany, UK, Spain, India and China, making Iran No. 7 with expensive gasoline among 14 countries.

3.2. The action leaning/research workshop on the car fuel price in Iran

The conducting of CLA learning workshop was not preplanned. Five students in the Ph.D. program in innovation policy at Tarbiat Modarres in the Fall semester 2019 were assigned to work on transition management and MLP on the subject of car fuel in the socio-technical system of mobility in Iran and the transition pathways it could take. They were supposed to present their presentation in the week of Nov. 19, 2019. The relevant class could not convene due to the protests following the shocking increase in the price of gasoline.

When the class resumed in the following week, the shock and trauma and the sense of hopelessness the students had experienced did not allow to go immediately back to the business as usual. Thus, I decided to change the subject and propose to discuss the roots of the unrest that the country went through. As a result of the vivid discussion and the review of the issue from different angles, we concluded to change the agenda and have an action research workshop on the meaning of the car fuel and why the price increase has led to such socio-political upheaval. Suffice-it to note that According to the requirement of the CLA workshop which is set by Inayatullah, “as a technique, CLA works especially well in workshops or in groups of five to a few dozen participants” (Inayatullah S., Causal Layered Analysis A Four-Level Approach to Alternative Futures RELEVANCE AND USE IN FORESIGHT, 2019).

We held the Causal layered analysis (CLA) workshop on 8 January 2020, just hours after Iran had attacked a US military base in Iraq and a Ukrainian passenger plane was shot down by the Iranian air defense system. The participants were overwhelmed with the chain of events. The social cleavages were vividly visible and the wounds still fresh. We were, yet to reach the post-trauma situation.

As we proceeded, each participant played the role of one stakeholder based on the normative stand that they chose to represent. The workshop dynamics was facilitated and monitored by me as the facilitator-instructor. The participants accepted the facilitator's rule of the CLA games process (Milojević and Inayatullah, 2015). They played the advocate of either national independence, social justice, market equilibrium, industrialists and environmental sustainability from the angles of social strata such as army officers, workers, industrialist, investors, environmentalists. The following is the report of this workshop:

4. First layer, litany: The news which resonates with participants’ fears and concerns

In the causal layered analysis, the participants first stated their position regarding the fuel policy and then chose their favorite headline from the mass media and let the other know that why they thought the selected headline is best describing what had been going on in the street. Accordingly, they expressed what kind of social groups they were afraid of Table 2.

5. Second layer; systemic analysis: The car fuel socio-technical regime of Iran

In the second round, the participants reviewed the systemic analysis of the socio-technical regime of car fuel in Iran.

The car industry and refineries both are among the symbols of national esteem and pride. Iran has produced 1.5 million cars in 2017, fifteen percent more than the previous year (association, 2018), ranking Iran the 18th among car producing countries with the fastest growth rate at the global ranking (Pedalnews, 2018).

The idiosyncratic feature shared by both car and energy regimes shows the omnipresence of the State as the major player. The ownership of 9 Iranian oil refineries should be at the hands of the State according to the Constitution (I.R.I constitutions, 1995). [1]There are 28 automakers of which two are the major producers (Saipa) and Iran Khodro with 54 percent and 46 percent of the output, respectively (Parliament, 2014-2015). Although, the automakers are listed in the stock market, in reality, the privatization process was complex, shifting the ownership away from the state toward a variety of parastatal organizations, including banks, cooperatives, pension funds, foundations, and military-linked contractors (Harris, 2013). Having said that, however, the privatization was tepid and the government still owns about 40 percent of major companies (Parliament, 2014-2015). The state also plays the dominant role in the management of the demand by determining the price of fuel.

Although there are different niche–innovation in the system, coming out of research labs and pilots, the advanced pilot plant of micro-algae,

[1] Chapter 4, Principle 43, para.8

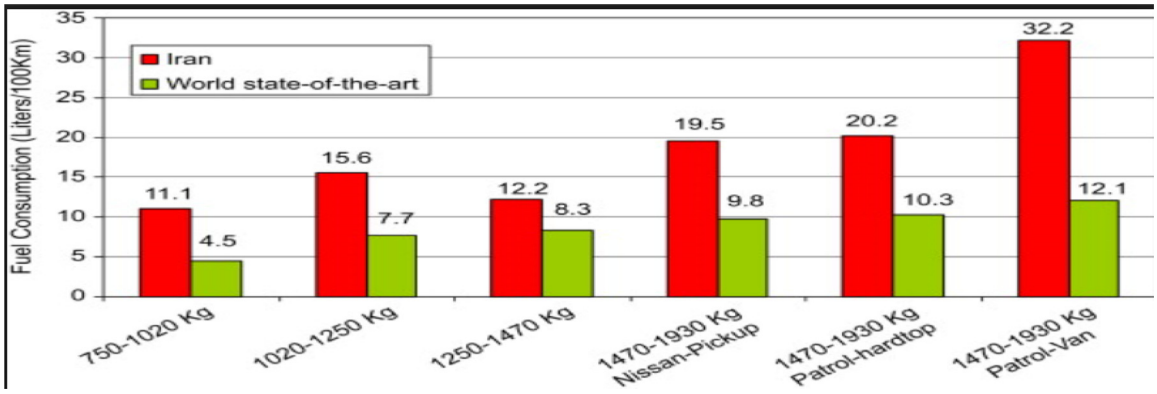


Fig. 3. Average fuel consumption in Iran and world state of art technology (Source: Jafary and Baratimalayeri, 2008)

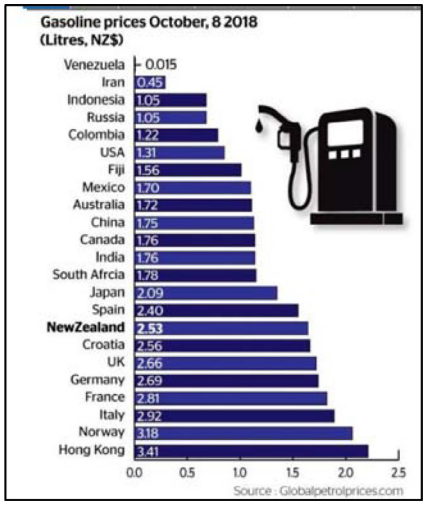
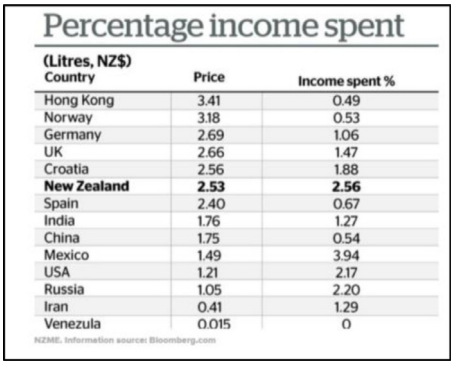


Fig. 4. Gasoline prices October 2018



Percentage income spent

(Litres, NZ$)

Country	Price	Income spent %
Hong Kong	3.41	0.49
Norway	3.18	0.53
Germany	2.69	1.06
UK	2.66	1.47
Croatia	2.56	1.88
New Zealand	**2.53**	**2.56**
Spain	2.40	0.67
India	1.76	1.27
China	1.75	0.54
Mexico	1.49	3.94
USA	1.21	2.17
Russia	1.05	2.20
Iran	0.41	1.29
Venezula	0.015	0

NZME. Information source: Bloomberg.com

Fig. 5. Percentage income spent for gasoline in different countries

the project of planting jatropha, the research project on fuel cell, hydrogen and electric car succeeded to attract different venture capitals attentions (Miremadi, 2019), overall, none of them proved to be market and technology ready as a result of many years of double carbon lock-in public policies, yet, this process failed to lead to market formation. Because the incumbent regime would use subsidy to keep the price of carbon based energy very low. None of the niches could show any sign of market readiness in this condition. These subsidies dwarfed any serious support for renewables and signaled continued willingness of the regime to prop up fossil fuel industries, despite symbolic expressions that the environmental laws e.g. “the law of clean air” conveyed.

The output of such contradictory mix of policy signs clearly raised red flag for the growth of renewable energy in Iran despite their potentials. Comparing to the renewable energy technology, natural gas had a better chance to join the incumbent regime: Firstly, natural gas is always a natural choice for Iran since it is the second country in the world in terms of gas resource (Sergie, 2017). Secondly, natural gas always positions itself as a clean technology worldwide (Suurs, 2009). It is known to be the cleanest fossil fuel and it has high energy conversion efficiencies for power generation (Wei, 2016). Thirdly, it had always been in heating system in the form of CNG and LPG in the world (Wei, 2016) and in Iran. In the first decade of twenty first century, it gradually came up with the middle ground solution between the gasoline and renewable energy in the transport fuels.

The first project of retrofitting a small segment of the transport fleet (unban buses) was set up to promote CNG in 1969 and continued gradually in different forms of research and development (Miremadi, 2019). The number of CNG fueled cars soon reached over four million. It has placed Iran at the rank of the first three countries with CNG-run cars together with China and Pakistan. The proponents also highlight the fact that replacing CNG with gasoline has generated $37 million of hard currency during 12 years (Shana, 2017).

6. Third layer- Discursive analysis

In the third layer, the participants at the CLA workshop approved of each other in the name of national solidarity. They noted that by rallying around the flag of national independence, technological development gained momentum and led to the production of high-quality gasoline for the first time in the country. It helped mobilized resources and human capital to build infrastructure like the Persian Gulf Star Petrochemical Complex, which produces enough better quality gasoline to meet internal demand. As a result, balance between demand and supply was restored and price stabilized with good effect on the middle class as well as on the efforts to decrease pollution. This alignment projects a homogenous society (Fig. 6).

However, the consensus around the flag of national independence faced the reality in the sense that the policy supply of cheap gasoline found itself to have some downsides, including the fact that cheap gasoline promoted the unmanageable demand and made smuggling of gasoline to neighboring countries very profitable. Soon after the temporary balance between demand and supply, the rising consumption of the gasoline could have sooner or later reached the point where the government should import. That would not be possible simply due to the expanding sanctions, which had already begun to limit Iran's oil export and limited the possibility of gasoline import or export. Therefore, the price hikes seemed to be the only way out.

The workshop participants finally tended to collectively approve of the rise in the gasoline price, each for different reasons. Their discourse and myth are reviewed in the following table:

Table 3:

Table 2
Litany of news regarding the events

	What is your stand regarding the shock therapy	Headlines	Whom are you afraid of
National Independence	Agree	The Rioters set fire on Banks and public buildings	fifth columnists seeking to destabilize the country
Industrialist	Agree	Increased gasoline prices reduce rents and corruption smuggling	People who sells their quotas and smuggles gasoline (asoline smuggles)
Market equilibrium	Agree	Gasoline price hike will fix the market (market equilibrium)	People who works in the black market
Environmental concern	Agree	Growing Gasoline price advance inter-generational justice	People who overexploit the natural resources and have short term outlook (tragedy of commons)
Social justice	Agree	subsidies for the poor favors income equality	People who seek to free ride at the expense of people who works and has jobs.

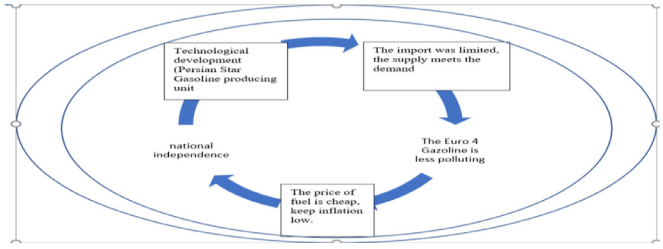


Fig. 6. Discursive consensus of the participants

7. The fourth layer: De-construction of Myth and Metaphor

In the fourth layer of the workshop, the facilitator introduced the post-structural methods (distancing, de-constructing-reconstructing and re-ordering) and suggested that each participant tries to distance his/herself from his/her role- identity for a moment (distancing) and imagining another role on the exact opposite side. That required to contest what seemed uncontestable to them until that point. Following Derrida's de-construction technique, they were asked to write their opposing view of what is their metaphor for car fuel, already cited in the Table 3 and build the Table of Difference which is shown here in Table 4.

The de-construction of the discourses reveals the ongoing struggles among different social strata, which underlie the discursive consensus of the social actors in the regime of car fuel in Iran. The policy portfolio of the Nov. 15 exposed these silent social struggles by including the interest of some and excluding that of the others. The de-construction technique addresses this inclusion–exclusion strategy and tries to reveal it by putting the social margins under the spotlight and exposes what had been in the dark.

The informal working class, street venders, undocumented emigrants and their children from neighboring countries, those who live on the margins of big cities and in shantytowns, those who make a living off waste picking, etc., do not have representation in any policy forum and evidently not in our workshop. They are in the blind spot of public policies and their interest has never been addressed by policy makers as a stakeholder.

8. Discussion

The policy mix of raising the gasoline price and compensating the people by increasing subsidies plus introducing a gasoline rationing plan seemed to be an ideal package for a society with one of the cheapest prices of gasoline in the world – as society that suffers from air pollution, traffic jam and the rising respiratory diseases. As the outcome of the policy, it was expected that the gasoline consumption would decrease and the import of hybrid electric cars and production of CNG fuel based cars would be promoted. As a result, the society would have new innovation/learning experience at the niche level. It looked a complete sustainability package to mitigate pollution, health problem, mobility jam nexus, which would suggest aiming towards a politically accelerated and coordinated sustainable transition.

The events transpired after the price hikes announcement revealed a reality totally different. Despite the fact that the street protest did not make a serious obstacle in the way of policy implementation, the trauma of the resistance against the policy change with such degree and magnitude has already its impact on will haunt decision making process in Iran for longtime. The protesters were the same actors that were uncovered by the de-construction of the action research workshop. Their protest demonstrated a form of regime resistance against a package of policy mix which can have positive effects in terms of sustainability. The reason, of course, was that the policy mix did not mean to address any of their underlying problems. Most of them do not have cars to have a quota and many lack an ID card required to qualify for subsidy. They use mass transportation and should cope with its fare hikes in the offing. The gasoline price raise is also expected to push the inflation rate upward, which is already galloping at around 40 per cent.

Conducting the CLA methodology, the research resulted in some important theoretical findings, including some norms and facts: At the level of social systems and causes, the MLP approach to the socio-technical regime in the literature with the emerging focus on developing countries can run the risk of being just scratching the surface of what is really happening in the society as long as the process of cultural meaning of policy change and innovation was not the focus of the study. Therefore, what is taken for granted in the literature with emerging focus is this process which is examined at the third layer in the part of world views and discourse analysis. Since there is no space for argumentative discourse and there is no interactive policy debates among different coalitions alliances in the non-reflexive societies, the

Table 3
The discourses and the un-contested center of discourses (Myth)

The normative role	The Discourse	The center of the discourse, (the myth)
National independence	It would increase State revenue	Gasoline is a source of national GDP
Industrial development	It would increase opportunity for export	That adds to the available foreign currency for the nation
Market equilibrium	It would manage the demand	Gasoline rationing helps the owners of cars
Environment sustainability	It would decrease pollution	Gasoline price hikes help decrease the pollution
Social justice	It would be another source of subsidy for the poor	Subsidy improves social justice

Table 4
: De-construction of the center of discourses (Myth)

	Myth	De-construction of belief system	What is revealed
National independence	Gasoline is a source of State revenue	Gasoline is a cost for people.	Policy includes a zero- sum game between State and people's revenues.
Industrial development	Export of gasoline increases the availability of foreign currency	Gasoline export benefits the state owned managers and parastatals	Policy does not encompass everyone in the society.
Market equilibrium	Gasoline quotas helps domestic industry	Gasoline quotas benefits the car owners	Not everyone has car.
Environmental sustainability	Gasoline price hike is good for environment	Gasoline price hike triggers rise of food prices and threatens food security	The welfare of the excluded people is the policy blind spot.
Social Justice	Subsidy improves social justice	Subsidy scheme discriminate against people without formal ID cards.	The policy does not include everyone in the society .

question of how to build consensus on the cultural meaning of change or stability at the regime level is never raised. The society looked homogenous as it is without any objection and argumentation.

At the fourth level, the de-construction techniques revealed many fractures in underlying structures and many blind-spots in the cultural dimension at the landscape level, which cannot change any time soon. The fourth level shows that the appeared consensus of the society is based on systemic exclusion of large part of the society which has no formal opportunity to represent its interests lawfully in the decision-making circles.

If we compare the levels of MLP and Layers of CLA, it seems that the literature with emerging focus tends to remain in the second layer of CLA with some foray into the third layer. With the help of CLA and Derrida's de-construction technique, the researchers are empowered to go beyond conventional framings of MLP to reach to the third and fourth levels of meaning.

CLA, however, suggests not to privilege a particular layer. Moving up and down across layers, we can integrate analysis and synthesis. In one of our moves from the fourth layer to the first layer, we notice the similarity between the characteristics of the excluded people in the fourth layer and the people that the participants pointed to as the ones they were afraid of in the first layer.

9. Conclusion

This paper started with a literature review that showed there was uncanny difference between the literature of MLP with original focus on its birthplace (Northern Europe) and the new literature, which documents the sustainability transition in developing countries. My argument was that the original focus had been benefitting from the vast and deep theoretical background of reflexive modernization theory and from there to the whole philosophical depository of theories of knowledge and social change in the West. The literature with emerging focus has obviously not been able to have the same theoretical embedding about the societies which do not have reflexive governance or, as we called it, non-reflexive societies. To fill this gap, I suggest MLP complements with CLA empowered by Derrida's deconstruction.

In this framework, by complementation, I mean deepening and broadening the perspective. My argument is that the perception of the literature with emerging focus of sustainability transition in developing countries seems to be rather superficial and narrow minded due to the fact that it does not stand on the shoulder of the giants of the grand theories of social change. I suggest that CLA empowered by Derrida's de-construction method fills this gap and complements this approach in the sense of broadening its focus which is on the central and formal social actors to further include the marginal or rather out of spotlight players. It also deepens MLP's analysis and leads it beyond conventional framings of MLP which majorly pays attention to techno-economic institutions, in order to disclose the hidden cultural meanings. In the jargon of Sohail Inayatullah, MLP has a tendency to remain in the second layer of CLA with some foray into the third layer. When it is complemented by CLA, it can reach to the third and fourth layers of analysis where the discourse and metaphors are examined.

Here, two questions were raised:

1 which points in terms of facts are missing in the literature of emerging focus, providing the fact that it lacks theoretical background of reflexive governance, e.g. modernity and modernization theory?
2 What is the relationship between non-reflexive societies and sustainability transition in terms of normative stands?

To address these questions, the paper used post-structuralist tool box in the process of an action research workshop with a CLA structure. To answer the first question, the paper illustrates that based on the workshop that was conducted on the theme “car fuel socio-technical system in Iran”, the coupling of MLP and CLA can produce knowledge about facts, which would have been hidden in the case the research were confined to the MLP framework. As the factivity, the paper shows that while in these societies a sizable part of populations lives and works in the informal sector and can impact the sustainability policies, they are not acknowledged and represented in the MLP framework.

Concerning the second question, which is about normativity, the paper shows reflexivity of the governance needs reflective individuals in the society. Collective sense making in the seemingly homogenous societies does not stem from discursive struggles and social arguments and it cannot produce reflexive governance since it tends to systematically excludes a part of society. Reflexiveness requires inclusion of others and this is the prerequisite of sustainable development in the vast part of the world.

The paper maintains that the sustainability governance requires not only technical-scientific and managerial capacity which can be transferred and copied from elsewhere but also it needs widespread democratic engagement able to foster a collective re-thinking of taken-for-granted views, such as through deliberative processes. This latter requirement cannot be transplanted from one geographical place to another and, therefore, we are dealing with the societies with no co-evolution between the hard and soft institutions. Since deliberative processes are relatively absent in making collective meaning in many non-Western countries, the transferred transition process does not convey the essence of sustainability, which are social learning and experimenting.

In the absence of such institutions, the action research workshop provides a milieu for researchers and co-inquirers to actively engage with mundane understandings and practices producing a theory of action about what is going on, what should be done and what will (not) work. It also raises awareness and builds (local) consensus on what the future can be.

However, the paper should conclude on this important note that these findings have some important limits. Action research, while engaging in real-world initiatives and experimenting them first hand, offers limited methodological standardization, and its explanation is often context-specific and short-term oriented without any attention to wider structural contexts. (Geels et al., 2016). Besides, the workshop

was conducted during an exceptionally political and policy charged atmosphere. That of course helped to blur the borders between learning in the class (in vitro) and in society (in vivo). However, learning and research action workshops in classes are just heuristics. They cannot be generalizable nor repeatable and they may not be a good source for extraction policy advice.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.techfore.2020.120029.

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