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Introduction to the special issue on “Grassroots and inclusive innovations: Conceptualizing synergies and complementarities”

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From the call for papers

This special issue was initiated in 2016 by the three co-editors with a "Call for Papers" (Gangopadhyay et al., 2016). After significant delays starting with co-editors' health and other personal issues, and ending with the COVID-19 Pandemic, the task of finalizing the special issue is reaching conclusion and it is time to take stock of the intellectual content. The objective of this introduction is to enable the audience to make easier sense when perusing the papers selected in a broader context, guided by conceptual framing.

We deemed it important to reiterate in brief several of the call for papers elements that illustrate the focus of the inquiry we hoped to facilitate. First, from the development economics point of view, we cited Dasgupta (2007), who pointed to the stark economic and quality of life differences between the lives of two girls - an American Becky and an Ethiopian Desta. The question implicitly related to innovation in the context of development economics: Why is Ethiopia not significantly wealthier than it was 5000 years ago?

The answers diverge, and we quote (Gangopadhyay et al., 2016): "Development economists considered several answers. These include: rich countries have more physical capital, more human capital and more technological capital from cumulative innovations through several centuries. Such innovations did not reach the poorer economies or are inappropriate for such economies. Social scientists will argue that these are just symptoms: modern economists will offer more fashionable answers that richer countries have better institutions to promote innovations."

The second example that illustrated the synergies between grassroots and inclusive innovations came originated with a UNIDO project, observed by a co-editor of the special issue Hauptman, in 1983.[1]

These types of innovations have been recognized and attracted recently significant attention and became the focus of the special issue: a) **Grassroots** innovations, which are initiated and developed by the same members of society who directly benefit from the innovation, and b) **Inclusive** innovations, which are typically bridging the institutional gap which prevents the benefits of market-oriented, mainstream innovations from reaching the bottom of the socioeconomic pyramid.

The institutional gap translates into gaps in knowledge, knowhow, economic resources, and infrastructure to subsequently share, diffuse, and built upon existing knowledge for cumulative progress.[2]

In the same call for papers, we also set the stage for building on the foundations of the extensive work by Anil Kumar Gupta and his collaborators (e.g., Gupta, 2012, 2013) that empowered grassroots innovation with the inclusivity drive and effort they brought to rural India and beyond.

Because one of the objectives of the special issue was, and we quote "… to spur meaningful conceptualization rather than split hairs about types and classes of innovation. We have embraced the positivist approach to knowledge, for better and for worse. This implies building on previous knowledge rather than trying to radically supersede it with "newer, bigger and better" constructs and frameworks."

We were hoping for "interdisciplinary and multidisciplinary conceptualizations and framing," "reflections and inductive theorizing about real life cases… for insights about new models of learning and knowledge development," and explicitly submissions "dealing with synergies and complementarities among types of innovations; among stakeholders; and among disciplines."

For good measure, to ensure a contemporary context, we also suggested to the potential authors to "consider such examples as Monaghan's (2009) and Smith et al. (2013)… "… that transcend the agricultural and developmental context articulated above (for instance, Smith et al., 2013, describe "grassroots digital fabrication")." and "Crowd innovations could be considered a grassroots innovation because people choose to undertake the innovations through informal channels and not through markets or by enforceable legal contracts. And the informal idea generation by the rank-and-file of a large high-tech corporation is defined as grassroots innovation, because it is informal and to some extent voluntary, driven by intrinsic motivations (Bailey and Horvitz, 2010)."

With these ambitious goals in mind, we were highly selective, and the review process produced only four papers that the reviewers and the editors could agree about their merit in addressing relevant aspects of

[1] Not to repeat the call for papers, it would suffice to summarize the case as an example of diffusion of modern tomato growing methods disseminated by the owners-entrepreneurs of a tomato sauce plant in a farming community in the Northeast of Thailand. It was remarkably successful because a representative-owner of the tomato sauce plant succeeded to empower the farmers to engage in grassroots learning and innovation.

[2] Quoting from the call for papers "Although there is often an interplay between [grassroots and inclusive innovations] (Fressoli et al, 2014), there are significant differences between grassroots and inclusive innovation in data availability, analysis and policy implications. Namely, while inclusive innovations could be traced back to science and technology, which are captured via the national Science and Technology Indicators systems, grassroots innovations are "invisible" due to lack of systematic, consistent, and quantitative data. This gap prevents econometric analysis and makes the drawing of policy initiatives extremely difficult."

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the call for papers.

Table of contents: key themes and summary of articles

Conceptual framing

Returning to the basics, the three types of innovation that are most pertinent to our conceptualization - social, grassroots and inclusive - are considered together as having the *motivation* of addressing the needs of segments of society that need assistance in partaking in and benefiting from progress in means of production and inclusivity of consumption. The innovations conceptualized under each of these constructs provide paths that could address such goals. At the same time, each of these constructs characterizes additional aspects of the innovation – in addition to motivation, they include the *actors* and *processes* involved in creating the original insights, resulting in designs, and the paths towards application, utilization, and diffusion. Clarifying the differences enables deeper understanding of effective overlaps and synergies.

The *Social Innovation* construct speaks of a social need being addressed and implies a segment of society benefiting therefrom (Tan et al., 2005). Under this descriptor, it matters not who initiated the innovation, who participated in its development or was involved. It is sufficient that the innovation met a social need or addressed a social problem.

Grassroots Innovation speaks of the bottom-up nature of the innovation, indicating that the innovation comes from within and by its own means, including knowledge, information, and competencies, of the social group that is going to benefit from it. Infusion of *external*, science- and technology-based information, such as knowhow and training, are not part of it.

Inclusive innovation, in contrast, describes the infusion of external inputs through human participation, even direct intervention, so that the innovation's outcomes benefit the segment of society, who, when left to their own devices, are excluded from the benefits that are enabled by scientific and technological progress. Their inclusion had never been specifically circumscribed by the literature and could encompass the innovation extending to them goods and services previously beyond their reach or providing access to involvement in communities or activities they did nor previously have access.

The synergy between inclusive and grassroots innovations, especially in terms of health, quality of life and economic progress has been practiced and researched[3,4]

In addition, if we take into account the research about grassroots innovations, especially in the Global South, has followed the lead from Gupta (2016), the publications presumably focused on grassroots innovations end up addressing the synergy between grassroots and inclusive innovations in some detail (e.g., Mokter, 2016). Often, grassroots and inclusive innovations jointly harnessed the experience, capabilities, contextual understanding and more recently the social capital and political power of the potential benefactors of the innovations.

Interestingly, because inclusive innovation activities are well-accounted by Science and Technology Indicators,[5] this at least partially resolves the "blind spots" in these Indicators, because grassroots innovations are "hidden innovations" (Marzocchi et al., 2019). By now, this issue has attracted the attention of researchers and policy makers,[6] who realized that as these indicators exclude grassroots innovations from policy considerations by governments and international institutions, they are consequently excluded from adequate resources, if any.

Consequently, overlapping and jointly applied grassroots and inclusive innovations are increasingly recognized as a workable solution to myriads of sustainability challenges, often seen as the *tour de force* for crafting ecologically and socially sustainable economies (see Sarkar and Pansera, 2017; Munõz and Dimov, 2015; Pacheco et al., 2010; York and Venkataraman, 2010; Monaghan, 2009; Dean and McMullen, 2007).

Grassroots and inclusive innovations are relied upon to create durable solutions for overcoming various knotty local problems with energy, health and food security without compromising on the sustainability of the local system of production, distribution and consumption (see Hargreaves et al., 2013; Seyfang and Longhurst, 2013; Seyfang and Smith, 2007). Despite their utmost significance for a local system, there is little understanding of the forces that create, drive, and inhibit such innovations (see Pansera and Owen, 2015; Smith and Ely, 2015; Smith et al., 2014). The dynamics of grassroots and inclusive innovations, and the associated entrepreneurial activities, is still a poorly understood phenomenon, which calls for a deeper examination (see Aras and Crowther, 2012; Gibbs, 2009).

One of the principal barriers to the study of grassroots and inclusive innovations is its intrinsic nature of being a bottom-up phenomenon, which mostly stays invisible to the top-down approaches of epistemological pursuits (see Prahalad, 2012, 2010). Such innovations are driven by actors who are specific to a particular social milieu, for overcoming a local peculiar problem in order to create a local solution visible, experienced and appreciated only by the local community. As a result, inclusive innovators, whose goals are to strengthen and diffuse grassroots innovation practices, are noted for aiding, creating and fostering an *essential network* of local production, distribution and consumption – especially in the developing world – with unintended consequences for local sustainability (see Agnihotri, 2013; Gupta, 2016).

Summary of articles

The four papers accepted for publication in the Special Issue are vastly different in conceptualization and research approach. They span the spectrum from discursive and qualitative to deductive and qualitative, which allowed us to order them from the most general and qualitative to the most specific and quantitative.

Another relevant attribute of all the papers is the loci of the data collected and analyzed. Although we were hoping for more representation of developed and more diverse geographic contexts, it is hardly surprising that all four papers focused on either developing economies (India and Namibia) or indigenous communities in a developed economies (Australia).

Although there were no systematic comparative studies of innovation approaches, the three papers that dealt with field research and specifics of innovation programs indicated that *leveraging grassroots innovation with inclusive innovation increased the probability of successful outcomes*.

Success factors and challenges of grassroots innovations: Learning from failure by Léo-Paul Dana, Calin Gurău, Frank Hoy, Veland Ramadani and Todd Alexander

The authors seek to tackle the full complexity of interactions related to grassroots projects between variegated types of stakeholders like citizens, local community, activists, practitioners, academics, and representatives of the local or national government. Being motivated by the recurrent failure of such projects, they attempt to develop a systematic process to identify and assess the factors responsible for the success of grassroots innovation projects. The systematic process includes a

[3] See also Foster and Heeks, 2013; Heeks et al., 2014.

[4] There are numerous examples in vaccination programs (e.g., Nasiru, et al., 2012), agricultural extension programs (e.g., Brunner and Yang, 1949; Jones and Garforth, 1992; Sayed and Shukrullah, 2019), and irrigation projects (e.g., Ghai and Vivian, 2014). The modernized approach to Traditional Chinese Medicine is another example (e.g., Qui, 2007).

[5] www.oecd.org/sti/msti.htm, *Main Science and Technology Indicators* by OECD (2018).

[6] E.g., Murphy et al., 2018.

diagnostic tool, which is based on existing theoretical frameworks, and a learning scheme from applying it to failed projects of grassroots innovations for homing in on its shortcomings.

The empirical setting of the case study was Namibia, facilitated by *Men on the Side of the Road* (MSR), a non-profit organization that is focused on improving the living conditions of marginalized populations residing in informal settlements.

Their findings point to the need for the adoption of a socially-inclusive approach involving activists, academics and/or government representatives that continuously interact with the local community in every phase of project design and implementation, to ensure grassroots innovation success.

External impetus, co-production and grassroots innovations: The case of an innovation involving a language by Wee-Liang Tan and Ghil'ad Zuckermann

The paper is a rare collaboration between academics of vastly different background and training - Ghil'ad Zuckermann is a linguist in Australia while Wee-Liang Tan is business management scholar with a Business School in Singapore. Consequently, Tan played the role of sense-making and secondary analysis anchored in innovation theoretical framework for the field work conducted by Zuckermann, who has been conducting an action research project with the Barngarla tribal group in South Australia.

Tan and Zuckermann argue that the conceptual boundaries of grassroots and inclusive innovations have not been carved in stone. These boundaries are still evolving. Their work draws our collective attention to the urgent need for exploring the benefits of complementarities and synergies by not compartmentalizing these innovations. They drive these points home with a nuanced case study of an Australian innovation of reclaiming an ancient language that had been lost through colonialization.

Innovation appears at various stages of the language revival project to cut across the typologies of grassroots, inclusive and social innovations, and complementarities in the three types contribute to project initiation, planning, and execution. From their findings, they suggest a conceptualization of grassroots innovation to include initiation of innovations by external parties and co-production on the part of local communities.

As numerous languages of Indigenous communities around the world have been "dying" in accelerated pace, Tan and Zuckermann put forward as a proposition a design of a language reclamation process that includes an effective partnerships, or 'co-production', between the external initiator of the idea and the grassroots community that embodies some elements of the innovation itself for the successful innovations at the grassroots level.

Barriers to grassroots innovation: The phenomenon of social-commercial-cultural trilemmas in remote indigenous art centres by Janice Jones, Pi-Shen Seet, Tim Acker, and Michelle Whittle

Jones, Seet, Acker and Whittle argue that the extant literature displays a distinct bias towards the successful grassroots projects while the barriers to grassroots innovations and failed projects have been pushed to the periphery. In their work, they seek to understand the major source of this bias. They highlight that the social enterprises are the key loci where such grassroots innovations take place. In understanding the motivations of social enterprises, they note that social enterprises are driven by multiple, often conflicting, objectives. Such multiplicity of objectives - with mutually conflicting elements - is identified as a major barrier for grassroots projects.

They focused on the trilemma faced by the actors leading the innovations in the context of indigenous art centers in Australia, juxtaposing the non-indigenous and indigenous managers of this centres. They face the trilemma posed by the demands of being viable as a business, fulfilling a social agenda and addressing cultural demands as they need to manage a center for indigenous art while not being part of the communities. Employing a qualitative approach, they offer insights about the manner the trilemma affected the decision-making and attitude of the managers and propose steps to address the barriers the trilemma posed.

To address the cultural dimension, the authors recommend the development of indigenous managers through mentoring and cross-cultural understanding through activities. Significantly, they recommend inclusive activities: interactions that foster greater understanding between Indigenous and non-Indigenous community members and the undertaking of projects with common goals.

Grassroots innovation and entrepreneurial success: Is entrepreneurial orientation a missing link? by Sonal Singh, Bhaskar Bhowmick, Dale Eesley, and Birud Sindhav

Singh, Bhowmick, Eesley and Sindhav put an entrepreneur between the initiator of an idea, or innovator, and the community, or the user of the benefits from the innovation. By doing this, they seek to reassess the established relationship between innovations, which is widely recognized as an important driver of entrepreneurship, and entrepreneurship, for grassroots innovations.

They argue that innovation is *integrally* linked to *entrepreneurial success* even in the grassroots context. Though they agree that 'all innovators need not be entrepreneurs', yet they recognize the potential for commercialization of grassroots innovations as an important driver of such innovations. They further argue that such pursuits of commercialization can lead to successful entrepreneurial activities at the grassroots level. Thus, they highlight the urgency to transform grassroots innovations from a non-commercial form to a commercially viable form. They also emphasize the bottom-up perspective in the context of grassroots innovations to trigger changes towards sustainable development.

The authors used structural equation modeling and a dataset they developed in the Indian-context to examine how new grassroots learning practices, local solution and networking capabilities influence the development of entrepreneurial orientation (EO), and to what extent EO mediates between economic benefits and non-economic benefits from entrepreneurial activity.

They found that EO fully mediated the relationship, emphasizing the significance of such orientation. Consequently, they recommend that the Entrepreneurial Orientation (EO) and the introduction of inclusive activities should be encouraged and developed in communities to trigger changes towards self-sufficiency and sustainable economic development.

We postulate here that such melding of innovation types is not only desirable but also required to enable and empower (Conger and Kanungo, 1988) the grassroots innovators to progress as far as they are potentially able to. The final part of the introduction will address the inefficiencies that are inherent to grassroots innovation, and which justify the involvement of inclusive innovation activities.

Way Forward: Why grassroots innovation need inclusive innovation (and vice versa)

With the extant literature, and the modest contribution of the special issue, we postulate that the complementarity of grassroots innovation activities are inclusive innovation are complementary. One the one hand, the inclusive innovations actors and processes facilitate and accelerate grassroots innovation. On the other hand, as made clear by diffusion of innovation research and practice, the knowledge of local context and culture enables effective diffusion of external ideas.

But while the latter point is accepted as part of innovation theory, the latter requires an explicit analysis and restatement. We emphasize here that our analysis is not a critique of the various efforts at grassroots innovation, but only a necessary articulation that calls for attention and resources both nationally and internationally to be dedicated to enabling grassroots innovation and narrowing the developmental divide.

The integration of grassroots and inclusive innovations brings together vastly different actors, on the one hand, intellectual elites,

highly educated in traditional systems, employees of government institutions and universities and institutes and on the other hand, low income, barely educated, mostly rural and small town, self-employed masses.[7] The subjects of Honey Bee Network action research were already innovating when "discovered," but, as expected, with minimal impact beyond the immediately adjacent location. The Barngarla tribe-members were incapable of reversing the tide brought up by their "discovery" by the colonizers, so that their inclusion in the ST-based intervention by an insightful and knowledgeable linguist was a necessary condition to any grassroots innovation to garner any results. In both cases, the target communities have significantly benefitted from the inclusivity intervention.

The underlying theories and empirical generalizations of innovation research are relevant for understanding and generalizing from inclusive and grassroots innovation activities and research. Gupta (2016) laid down the clear objective of identifying grassroots innovation activities in the villages and small towns of India and empowering the innovation actors with modern concepts and tools, transitioning them into membership of ecosystems and quasi-incubators. Even as the carrier of the Grassroots Innovation "flame", he and his colleagues understood that inclusive and grassroots activities innovation are complimentary, with inclusive innovation facilitating and accelerating grassroots innovation. But being action research with transformational and change goals, both the Honey Bee Network and the action research around it, intentionally or inadvertently, ceased being about grassroots innovation alone.

Origins of Gupta's initiatives (2016) that gave India the Honey Bee Network and its spinouts and derivatives, are about revolutionizing the innovation process and the learning process that is supposed to lead to it, while legitimizing questioning of the old and prominent by the young and insignificant, as experience comes from the past but we must design the future (Gupta, 2016, P.44: "experience is like a rear-view mirror; it shows you the road travelled by does not tell you where to go")..

It should be noted that the main cause of the inefficiency of grassroots innovation is structural: there is no guiding theory, no paradigm, extremely limited empirical generalizations, without any motivation or intent to theorize and generalize. It suffers from the usual malaise of theory-devoid empiricism, as there is no inductive or deductive flow of reasoning. The practiced ad hoc theories (as hypotheses) are tested only internally, not against universal science, in an insular community of practice of one or a single village. For example: how would a grassroots innovator make sense of exceptional but accidental results in any context, as they do not typically possess the research experience and education-based systematic logical reasoning required to understand the key parameters and their interrelationships?

There are no embedded mechanisms that spur grassroots innovation to continuously improve current practices, to continuously progress the state-of-the-art. The typically rather specific insights do not lend themselves to aggregation and accumulation, building on each other with scaffoldings of theoretical or conceptual frameworks, such as the Aristotelian framework for advancement of knowledge (McKeon, 1947; Angioni, 2016), and its more recent incarnation in Kuhn's structure of scientific revolutions (Kuhn, 1962). The rhetorical question we are posing is "how would grassroots innovators make sense of new knowledge promoted and explained in these two treatises by Thomke (2020) and Iansiti and Lakhani (2020)?"

- Would the simple context of theory-devoid empirical tweaking become more complex and adequate to create new advances from the grassroots?
- Where are the limits of grassroots, even leveraged by inclusive innovation?
- Would the empirical methods deployed by the natural grassroots agricultural and small business actors that intend to solve problems through experimentation, which includes observation and causal reasoning, be effective for solving problem with innovation?

A possible counterexample, which fails in our opinion, is related to users' innovation (e.g., von Hippel, 2005; Baldwin and von Hippel, 2011;), as grassroots innovators are not equipped with the industrialized technological experience that the innovating users possess. Their economic need is probably extreme, bordering on survival, but their competencies and capabilities limit them to an inefficient search in a not well-defined space.

Herein lies an area of overlap: When the barriers between the local and limited loci of activity are broached, what was initially intended as social innovations or grassroots innovations, would naturally become inclusive innovations. The moment the innovation process begins, and the type of participants broadens, inclusivity commences. As innovation, by definition, is a process where the designed solution, which becomes the innovation when applied, social innovations and grassroots innovations invariably transform into inclusive innovations. This situation is illustrated in Tan and Zuckerman (forthcoming in this special issue).

Finally, in view of the identified inherent weaknesses of grassroots innovation, the purpose of understanding grassroots innovation should facilitate progress, emulating the goals of Gupta and the Honey Bee Network (Gupta, 2016) – making it more effective, productive, and possibly more widely practiced, by stimulating grassroots innovation with methods, frameworks and tools from the mainstream science-based management of innovation. A tongue in cheek conclusion to this revisionist analysis, we suggest that the more accurate title for Gupta (2016) should be *Empowering Minds on the Margin: Leveraging Grassroots Innovation with Modern Models of Innovation.*

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[7] One distinction between the linguistic project by Tan and Zuckermann (Forthcoming in this Special Issues): The described language recovery initiative is addressing the failure of grassroots resources and priorities, evidenced by the death of numerous indigenous languages, being the result of genocidal extermination of the users of these languages below the threshold of natural recovery. This, subsequently, caused deterioration in cultural identity and resulted in dysfunctional communities.

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