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The promise of positive deviants: bridging divides between scientific research and local practices in smallholder agriculture

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Positive deviants challenge existing organisational structures and institutional set-ups, and promote alternative approaches to solving seemingly intractable social problems, either playing direct role of a boundary spanner or indirect role as activists. However, these roles of positive deviants have not yet been recognised to its potential in international development because the legacy of deviancy theory lies on negative deviants, such as addicts and criminals. This paper investigates the promise of positive deviants to bridging scientific research and local practices using empirical evidence from community-based participatory research of rice, a crucial subsistence crop in the Chitwan district of Nepal. Non-profit private and public stakeholders worked as boundary spanners, specifically to initiate stakeholder interaction with non-traditional partners, in spite of the lack of enabling environments to do so. Similarly, one of the members of a farmers' group developed a rice variety from a handful of seeds taken from a scientific experimental plot, initially without the knowledge of participating scientists. This research suggests that positive deviants have ingenuity to innovate, deviating from norms particularly when social and organisational environments limit stakeholder interaction for learning and innovation. This paper concludes that the collective intelligence of positive deviants can sustain or even stimulate innovation permitting people to survive, experiment new ways of doing things and even improve their living conditions under adverse social, political and agro-ecological circumstances.

Introduction

Agricultural knowledge is managed in sometimes highly contested environments where uncertainty characterises stakeholder interactions. This paper examines one dimension of the disorder, namely the role of *positive deviants* who act against the structures and 'rules of the game' in agricultural knowledge creation, application and regeneration. The context of the discussion is a case study of facilitated interaction and innovation between formal and informal knowledge systems in rice improvement in Nepal.

Positive deviants help introduce new approaches to old organisational structures and institutional set-ups. They challenge the *status quo*. Deviancy is a phenomenon where individuals deviate from norms of silence, the norms of the reference group (Warren 2003). The classical literature on deviancy usually focuses on negative deviancy, such as theft and addiction. However, the contemporary literature on deviancy, particularly in international development, also addresses the phenomenon of positive deviancy: positive deviants as powerful agents of change, such as bridging the divides between expert and local knowledge systems (Sternin and Choo 2000, Ochieng 2007, Biggs 2008).

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Positive deviants believe in innovation through self-determination, self-control or self-realisation – the philosophy of positive liberty (Berlin 1969, Hirschmann 2003). They initiate change in spite of difficult social and organisational environments: full of unpredictable obstacles or interferences. Moreover, they believe that challenging the *status quo* is one way to harness individual creativity and innovations in spite of constraining social structures and institutional set-ups (Amabile *et al.* 1996, Ekvall and Ryhammar 1999). In other words, social structures impose constraints to individual agency or action. Indeed, structure and agency are a duality that cannot be conceived separately from one another (Giddens 1984). Individuals are not free to choose their action and at the same time they reproduce social structure and initiate change processes. The interplay of individual creativity emerging from self-determination and favourable social environments shape what is referred to as the 'capacity to innovate' and is integral to identifying knowledge-based gaps among stakeholders (Pant and Hambly Odame 2006). Innovation capacity entails the development of context specific range of skills, actors, practices, routines, institutions and policies needed to put knowledge into productive use in response to evolving challenges, opportunities and technical and institutional contexts (Hall 2005).

This research uses specific examples of positive deviancy in rice improvement in Nepal that have been developing since the 1960s. The analysis of published literature and interviews with public and private stakeholders in formal scientific organisations and rural communities illustrates the promise of positive deviants for initiating change within the broader context of ongoing challenges for community-based participatory research and development. This paper argues that positive deviants are instrumental in changing predominantly public research and extension systems, particularly when stakeholders work under difficult social, political and organisational environments. In the context of Nepal, the disorder includes armed conflict, poverty and social division (Quy-Toan and Iyer 2007). In this respect, Nepal is characterised by intense rural endurance as seen in other regions of the world which are extremely dependent on renewable natural resources and agriculture (de Soysa and Gleditsch 1999, PRIO/CMI 2003). The authors posit that although it is a challenge to sustain agricultural research and development interventions in adverse circumstances, positive deviancy in such circumstances can provide leverage in introducing the processes of change, such as community-based participatory research and development interventions that are often considered peripheral to mainstream research and development and national political interests.

The phenomena of deviancy

The research legacy for the concept of deviancy lies in the study of functionalism, a theoretical perspective that the social world is 'objectively real', posited by French sociologist Émile Durkheim (1858–1917). One of the critiques of this paradigm was its failure to address human agency. During the mid-twentieth century, Merton (1957) and Parsons (1961) addressed this limitation by positing a theory of deviancy in order to focus the functionalist paradigm on controlling undesirable acts of human agency. In this respect, functionalists perceive the phenomenon of human agency as actual or potential negative deviancy, whereas critics of functionalism emphasise that social actors are required to work under a defined social structure, which often constrains individual agency or action and at the same time they shape social structures. This is referred to as the duality of structure, a constant interplay between agents' actions and the structures around them (Giddens 1984).

However, deviants, who depart from the norms of the reference group, can be either aberrant or non-aberrant in their action (Merton 1957). Non-aberrant individuals are positive deviants, while aberrant individuals are negative deviants. Most deviants hide their

Table 1. Typology of deviant behaviour.

	Accept social/cultural goals	Reject social/cultural goals
Access to structural/ institutional means	*Conformity.* Individuals accept the culturally defined goals and have access to the structurally defined means, e.g. conformists	*Ritualism.* Individuals reject the culturally defined goals despite access to the structurally defined means, e.g. inflexible bureaucrats
Deny or lack access to structural/ institutional means	*Innovation.* Individuals accept the culturally defined goals despite a denial of or having no access to the structurally defined means, e.g. social activists	*Retreatism.* Individuals reject culturally defined goals and deny or have no access to the structurally defined means, e.g. addicts, thieves *Rebellion.* Individuals behave as in retreatism, but aspire to substitute the existing goals and means by new ones, e.g. rebels

Source: Adapted from Merton (1957).

illicit behaviour, but the positive deviants rebel openly and challenge the legitimacy of social norms through their self-determination and aspiration to achieve social goals (Table 1). Furthermore, positive deviants challenge structural means while accepting social goals, but negative deviants challenge both structural means as well as social goals. An individual's aspiration to succeed, thus, involves accepting social goals and is often determined by structurally defined means, such as access to physical resources and favourable social and organisational environments.

Self-determination among positive deviants occurs individually as well as collectively. This has been noted for instance in studies on farmers' organisations whereby individual opportunistic behaviour is accepted in order to ensure the long-term needs of the collective action. Hambly Odame (2002) argues that women in farmers groups in western Kenya accept men as members, even when the men assume titles such as 'organising secretary', because their individual aspirations as leaders are more socially accepted within the collective identity of the women's group.

To reiterate, positive deviants are those individuals who accept social goals and values despite having no or limited access to structural means to achieve those goals, or simply denying the existing structural means for a good reason. While negative deviants reject socially defined goals without any substitutes of existing means and goals, rebels resist or reject structural means as well as social goals in an aspiration to substitute the existing means and goals. In other words, this level of resistance aims to overhaul the old organisational structures and institutional set-ups, specifically when people believe that their creativity and innovations are constrained more by the absence of enabling environments than intuition and self-determination (Berlin 1969, Hirschmann 2003).

In development context, the behaviour of positive deviants is often associated with how stakeholders respond to decline in communities, organisations or the state. The three most common responses to a decline are exit, voice and loyalty (Hirschman 1970). Exit is a market or economic mechanism where members leave his/her community, organisation or nation in search of a safer and better future. For example, a resource-poor rural family can choose to migrate from their community, employees can quit their unpleasant job or

the citizens of a country may become refugees to avoid suffering from an enduring insurgency. Voice is a non-market or political mechanism where members remain within their community, organisation and nation, and express their concerns in an effort to improve the overall situation.

Specifically, positive deviants are the ones who make their voice heard through various direct and indirect mechanisms. They directly initiate changes through spanning the traditional boundaries of their organisation and indirectly influencing decision makers through activism, such as lobbying, boycotting or protesting. However, such a linear decision making process involving the binary choice between exit and voice seldom occurs in real-life situations because of the social networks, kinship, moral obligations and loyalty towards ones community, organisation or nation. Here loyalty specifically refers to strong patriotism to the nation or love and affection to one's community, organisation or nation. Thus, a complex interplay of exit and voice is often common. For example, while loyalty or specific institutional barriers can provide a hindrance to exit, the effective use of voice requires a great deal of social activism. Moreover, loyalty can also be developed through less appealing exit options, such as small job market, political and financial hurdles to emigrate, potential injury and death of kin in an insurgency, and finally due to the fact that exit can also be mental or emotional without necessarily leaving one's organisation or nation. The loyalty behaviour reinforces the phenomenon of positive deviancy.

Although the sociology of deviancy has been introduced in international development, the practice of learning from the behaviour of positive deviants is still emerging. We now turn to examine a specific case from rural Nepal of how positive deviants help introduce technological, organisational, and institutional changes breaking the *status quo*.

The evolution of participatory rice research in Nepal

The development of participatory rice research in Nepal dates back to the Lumle Agriculture Research Centre (LARC) and Pakhribas Agriculture Centre (PAC), which were established by the UK Government during the late 1960s in the western and eastern hills of Nepal, respectively. Initially, these centres were established to rehabilitate retired British Gurkha into rural agriculture in their birth places. Later during the mid-1990s, the UK Government encouraged the consolidation of both centres into the Nepal Agriculture Research Council (NARC), a strategy also consistent with reduced public investment in agricultural research and broader structural adjustment policy in Nepal. Since Nepal has never been colonised, it should not be confused with a post-colonial adjustment. After the integration, a group of researchers who were associated with the LARC and CAZS-Natural Resources, University of Wales, Bangor, UK, were committed to continue participatory research in Nepal. They were specifically inspired by the release of 'Machhapuchhre 3' rice in 1996, the first main season rice variety in Nepal to arise through participatory plant breeding (under the leadership of the UK Government) (Joshi *et al.* 1997), but remained sceptical about favourable work environments at LARC to conduct participatory plant breeding under the leadership of the Nepal Government. Of the 50 rice varieties released in Nepal for cultivation until 2007, only 11 varieties were recommended for dry season cultivation (Figure 1). Moreover, only two of them are bred through participatory breeding processes. Clearly, the focus of the national rice research systems is on main season rice cultivation under relatively favourable production environments while the philosophy of participatory rice research is to breed varieties with adaptation to local cultural and agricultural practices under adverse circumstances. Many scientists committed to participatory

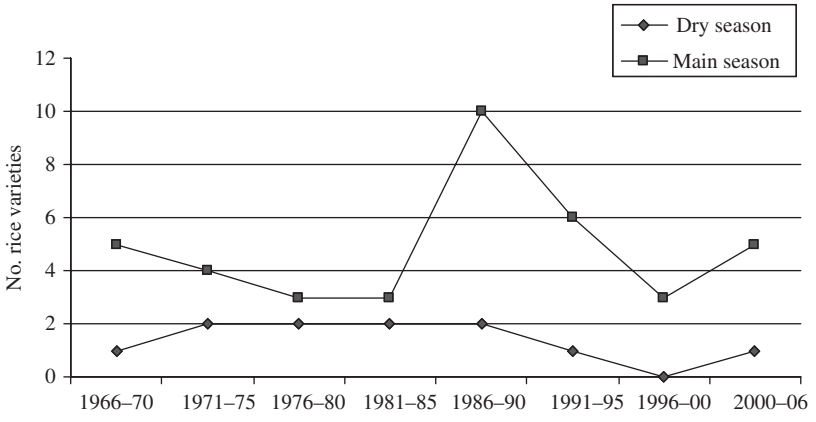

Figure 1. Number of rice varieties released since the 1960s.
Source: National Seed Committee of Nepal (2007).

research for sub-optimal environments voluntarily left LARC, while others continued working under the new leadership. Before they officially quit the job and fully engaged in participatory research outside NARC, a small group of their colleagues were delegated to establish a Non-Governmental Organisation (NGO), Local Initiative for Biodiversity Research and Development (LI-BIRD).

Since its establishment in 1995, LI-BIRD has been involved in community-based participatory research and development. One of the initial activities was under the DFID's 11-year Renewable Natural Resources Research Strategy (RNRRS) programme, which took place between 1995 and 2006 – LI-BIRD being involved in a series of crop improvement and participatory rice breeding projects in Nepal with the technical facilitation of CAZS-Natural Resources. This period coincides with the decade-long armed conflict in Nepal where most NGOs abandoned their research and development interventions in rural communities, and public research scientists and extension agents remained vigilant about security situations and substantially reduced their field activities. Although the strongholds of the insurgents were mainly in the western Nepal, the political situation in Chitwan district of south-central Nepal, where major components of the rice improvement projects were implemented, was as volatile as elsewhere. The first phase of the participatory crop improvement (PCI) project commenced in 1996, the year rebels initiated insurgency in rural Nepal. This was followed by the first phase of participatory plant breeding (PPB) project in 1998, second phase of PCI in 2000, and two PPB projects in 2001, and 2004, respectively (Joshi *et al.* 2005). Although PCI and PPB were implemented as separate entities, a complete PCI includes a selection of source germplasm, pre-breeding trait development, cultivar development, participatory variety selection, seed multiplication, and seed supply, all aimed at developing locally adapted rice varieties and thus achieving food security and reducing hunger and poverty in rural Nepal, one of the explicit causes of insurgency.[1]

Positive deviants in formal sector organisations

Although informal public–private collaborations based on personal goodwill were in place as early as 1996, it took several years to establish formal working relationships between the project and the public sector (Joshi *et al.* 2003). In collaboration with CAZS-Natural

Resources, LI-BIRD took a novel approach to collaborate with the public sector research and extension organisations. This initiative was a significant deviation from the mainstream NGO activities in Nepal during the mid-1990s when NGOs were involved more in social and political activism indirectly influencing policy decisions than directly engaging in research and development interventions. It took almost three years to establish formal collaborations between the District Agriculture Development Office (DADO) Chitwan, a local subsidiary of the Ministry of Agriculture and Cooperatives (MoAC), and LI-BIRD/CAZS-Natural Resources, because there were no clear directives from the MoAC in Kathmandu to work in partnership with NGOs.

In 2000, after several years of informal collaboration, the positive deviancy of informal collaboration was further strengthened as the extension workers at the DADO Chitwan took a challenging step of signing a project specific formal agreement with LI-BIRD. According to the agreement, DADO Chitwan proposed a budget to buy pre-released rice varieties demanded by farmers and planned to distribute them as mini-kits (Joshi *et al.* 2005). The funding, which in fact came from the project, was proposed in the annual plan, and finally approved by the Nepal Government. The first author, when he worked with DADO Chitwan, was involved in the planning processes and realised that farmers were empowered to articulate their demand, through insurgency as well as their participation in agricultural research and development interventions. One such articulation of demand is the unusual request for seeds of rice varieties that had not been formally released by the government. The practice of distributing mini-kits of the pre-released rice varieties was a clear deviation from the normal extension practice of distributing mini-kits of formally released crop varieties, using exclusively government funding. This was further emphasised by signing of an agreement with the Agriculture Research and Extension Project (AREP), a World Bank project in Nepal jointly implemented by the Department of Agriculture (DoA)/MoAC and NARC in 2001, and the AREP provided a small fund to promote uptake of pre-released rice varieties in other districts of Nepal[2] (Joshi *et al.* 2005).

In 2002, a formal agreement was also reached with the National Rice Research Program (NRRP) of the NARC to collaborate on disease screening and multi-location trials of the rice varieties developed in Chitwan (Joshi *et al.* 2005), specifically to generate quantitative data required for variety release and registration. As a result of this agreement, two *barkhe* (main-season) rice varieties, 'Barkhe 3004' and 'Sunaulo Sugandha', were released in 2006 and 2007, respectively. These became the second and the third officially released rice variety in Nepal derived from community-based participatory research (the first was 'Machhapuchhre 3').

Positive deviants in rural communities

Under the rubric of community-based participatory plant breeding, crop variety development was done in farmers' fields in collaboration with farmers' organisations. Young farmers' groups, especially the Jaskelo Youth Club (with whom LI-BIRD signed an agreement), were instrumental in helping select promising rice varieties through trait evaluation, including in-the-field plant selection, milling recovery, and organolaptic tests. Later, the Club's roles were taken over by a sister organisation of both youth and adult farmers, the Devujjal Agricultural Community Association. Although most members of these farmers' organisations conformed to the project-based participatory plant breeding procedures, one youth member, who is radical towards the existing social structures and provided a strong voice for the decade-long insurgency, demonstrated a behaviour of positive deviancy. He has developed his own rice varieties from an advanced bulk of seed using breeding lines

Table 2. Farmers' rationale to breed rice varieties.

Variety	Release year	Characteristics
CH-45	1966	Suitable for dry season, coarse grain, lower market price, poorer food quality, hard to digest
Masuli	1973	Suitable for main season, finer grain, better market price, better food quality, easily digestible
DR Dhan/Judi 141 F	Not yet released	Suitable for dry season, finer grain, better market price, better food quality, easily digestible

Source: Joshi *et al.* (2005); Focus group interviews with the members of Devujjal Agriculture Community Association in December 2006 and July 2007.

that were grown by the project, initially without the knowledge of the project staff. His vision was to breed a *chaite* (dry season) rice variety with characteristics similar to 'Masuli', one of the popular *barkhe* (main season) rice varieties, to potentially replace 'CH-45', one of the popular, but obsolete *chaite* season varieties (Table 2). With this vision, the farmer has selected 'DR Dhan' (DR Rice) and 'Judi 141F'.[3]

'DR Dhan' and 'Judi 141F' were subjected to disease screening in NRRP's research stations, as this task, according to the on-station breeders, was risky to do on farmers' fields. It is argued that disease would spread to neighbouring crops, often epidemically. If 'DR Dhan' passes through disease screening, this variety will soon be subjected to multi-location testing, also in NARC's research stations, and potentially in mother-and-baby trials.[4] The farmer expressed scepticism of doing the disease screening tests on research stations, where he has limited access. He further comments:

> 'DR Dhan' is liked by my neighbours and it did not show any disease symptoms here in Chitwan. I heard that scientists observed disease symptoms in their trial plot which was done during the *barkhe* season, but this variety I selected for *chaite* season.

Here, farmers' accessibility to the research station is a concern, not only the geographic distance, but also the hierarchical culture of the public research systems – the latter is more detrimental and often challenged by positive deviants. Not only farmers' varieties but also the recently released rice varieties 'Barkhe 3004' and 'Sunaulo Sugandha' had to go through disease screening and multi-location testing in research stations as the standard procedure to generate quantitative data for a variety registration and release.

Positive deviancy and policy processes

The phenomena of positive deviancy in formal sector organisations and rural communities can inform policy processes, as suggested in the case of rice improvement in Nepal. Firstly, the establishment of LI-BIRD to facilitate participatory research and development challenged the widely held perception of civil society organisations as 'social and political activists' and the government as 'inflexibly bureaucratic'. Positive changes were initiated to facilitate stakeholder collaboration, involving public and private scientific organisations and rural farming communities.

Secondly, as the public–private collaboration received wider acceptance, the LI-BIRD–DADO Chitwan linkages were further replicated in other districts of Nepal, not

only in plant breeding, but also in other research and development interventions in renewable natural resources and agriculture. The initiatives of public and private stakeholders in Chitwan to work together in spite of the lack of enabling environments later serve as a case to initiate changes in the public policy governing public–private partnerships.

Thirdly, in an effort to enable innovations in agricultural research and development through the participation of civil society organisations, there have been changes in the crop variety registration and release procedure in Nepal, specifically to include varieties developed through multi-stakeholder collaboration – NGOs, private sector, farmers' groups, and the public sector research and extension (Joshi *et al.* 2005). Before these policy changes were made, only the public sector plant breeders were able to propose a variety for registration and release.

Fourthly, in spite of the desirable policy changes, the alignment of policy and practices of crop breeding is a work in progress, an unfinished uphill battle: the regulatory changes in crop varietal release were made through collaborative efforts of stakeholders, but the implementation is still an ongoing challenge. Unless the policy changes in varietal release procedures are reflected in the plant breeding and variety testing practices, these changes would be less meaningful to rural farming communities. This challenge is already apparent by the story of the farmer who developed 'DR Dhan' and 'Judi 141F'. Whether and how these varieties meet modern scientific standards of on-station testing and quantitative data generation determine their formal registration and release as official rice varieties. To comply with the variety release procedure, the crop varieties need enough quantitative data, which requires rigorous scientific procedure on research stations, to show that they are superior to other existing varieties, such as 'CH-45' in case of 'DR Dhan'. Only with further testing on research stations can the varieties be proposed for an official release because the changed variety release procedure does not provide a provision to register crop variety without quantitative data generated at research stations. This uphill battle is because crop varieties that are developed in farmers' fields involving over a decade-long community-based intervention are arguably subjected to formal testing in research stations as if such a variety has never been released for cultivation and would have potential risk for the entire farming community. However, registration and national listing of a crop variety does not require such a rigorous scientific procedure.

Finally, the notion of newness to farmers' innovation should be assessed with a procedure. How farmers define whether something is innovative would be different than the scientific criteria of novelty, such as variety release, patenting and publications. For example, the rice varieties developed by the deviant farmer have been approved by his fellow farmers as superior to other existing rice varieties. Rather than external actors with different value systems determining the innovativeness, the rural communities themselves are the agents to determine whether something is innovative or not. This way a laggard can be forward looking and innovative, and a seemingly inferior initiative can be a breakthrough (Rogers 2003).

Appreciating the intelligence of positive deviants

The policy changes reflect the promise of the public and private stakeholders involved in non-traditional roles when the country went through a decade-long armed conflict jeopardising most research and development interventions. Many NGOs had to abandon their projects in rural areas and government's research and development budgets and infrastructures had to be diverted to fight against insurgents. The significant positive deviances under the adverse social, political, agro-ecological circumstances in rural Nepal were as follows:

(a) a catalytic role of the CAZS-Natural Resources South Asia Office in Kathmandu, (b) LI-BIRD's initiative to work with the public sector and rural farming communities, (c) the DADO Chitwan's collaboration with an NGO when there were no clear directives from the ministry to do so, and (d) the commitment of participating farmers in scientific research and development, including the development of their own rice varieties.

If we appreciate positive deviances within the context of political conflict in Nepal, it is important to discuss how the conflict impacts the general perception of Nepalese people in formal sector organisations as well as rural communities. Rural Nepal's struggle to progress in the knowledge economy is limited by people's faith in fatalism, a doctrine that events are fixed in advance so that human beings are powerless to change them (Bista 1991). Obstacles exist by chance not intentional change. In the past this faith largely influenced the way various stakeholders worked in rural Nepal, but once the country plunged into conflict, which began with insurgency from rural areas, this faith in fatalism was substantially shaken with subsequent challenges to the *status quo* of formal sector service providers and rural communities. For example, the rural population began to see that disproportionate land allocation was not due to luck but was a result of the influence of elites on the behaviours of the officer-in-charge of land reform (Joshi and Mason 2007).

Certainly, at a time when people were challenging the constitution of Nepal by rewriting it through the elected Constitutional Assembly, stakeholders particularly from the public sector found that rewriting a variety release procedure was an issue peripheral to the bigger shifts occurring in national politics. However, the change in perception among government bureaucrats and rural communities provided leverage during the negotiation process of changing variety release procedure. The change in perception also encouraged rural stakeholders in public sector organisations to work in partnership with NGOs when there were no clear directives from the ministry to work in partnerships. In the process, managing differences was more important than eliminating non-traditional partners (Pant and Hambly Odame 2006). Since there was very limited opportunity in Nepal to exit from the government jobs during the decade of insurgency, government employees, particularly at the local level, became loyal to their employer as well as farmers, and expressed their voice through the behaviour of positive deviancy. Similarly, the NGO staff and rural farming communities were loyal to the agrarian economy and sustained their interest in community-based participatory research and development.

The changes in the crop variety release procedures are described as positive unintended consequences of the project interventions because this was not a stated project goal (Biggs 2007, 2008). However, the literature remains subtle about the negative unintended consequences of well-meaning interventions in policy and practices. A key contribution of this paper is to fill this gap addressing both positive as well as negative unintended consequences of purposive human actions (Merton 1936). To generate enough quantitative data required for registration and release of 'Barkhe 3004' and 'Sunaulo Sugandha', LI-BIRD collaborated with the NRRP scientists and embraced modern scientific crop variety testing procedure in spite of their research capability and strong belief on the ongoing uphill battles for community-based participatory research. The unintended negative consequences of the well-meaning interventions in policy and practice were that the rice varieties that had been developed on farmers' fields over several years finally were subjected to testing under so-called rigorous modern scientific testing procedures at public research stations. Doing so required taking varieties developed through participatory processes back into the centralised breeding processes within the fences of scientific establishments. This revealed that although the policy changes enabled participatory plant breeders outside the public system to propose a variety for release, in practice farmers' varieties are arguably

subjected to on-station breeding practices that are entrenched in the older regulatory framework designed to manage varieties with wider adaptation. The rationale of doing community-based participatory research is once again compromised – a regressive practice limiting shift away from government regulation to democratisation of innovation, and a practice of testing innovation generated by sons of the soil up against desk-bound research and development officials (Adams and So 1996, Lockie 2004).

More than a decade earlier, it was commented that 'developing countries adopted from the USA and Europe a regulatory framework designed to release few, widely adapted cultivars for intensive, mechanised, monoculture cropping systems' (Witcombe 1996, p. 26). The key assumptions of modern scientific plant breeding are selection under favourable biophysical environment at research stations; genetically distinct, uniform and stable varieties; varieties with wider adaptation; locally adapted varieties either replaced or developed into widely adapted varieties leading to crop diversity depletion in farming systems; no or low involvement of end users of new varieties in the variety development processes; and dissemination of varieties through formal registration and release (Ceccarelli and Grando 2002). The implications of the public sector *status quo* in participatory and farmers' breeding practices are still apparent in Nepal because the crop variety testing procedure under the revised regulations required to follow at least some of the assumption of the centralised modern scientific breeding, such as on-station testing for wider adaptation, and formal registration and release.

Unlike plant breeders' knowledge and innovations, farmers' knowledge and innovations are often location specific, and farmers grow and select a crop variety if it performs better than other available varieties in the local agro-ecological and socioeconomic conditions. Local adaptation and increased food production are their social goals whether or not they have an access to structurally defined means, such as provisions to release and register their crop varieties (Merton 1957). Therefore, self-determination and self-realisation is more important than an ideal environment, which is almost impossible in rural communities and specifically during adverse social, political and agroecological circumstances. Individual agency transforms into collective agency subsequently challenging the social structural deficits (Lockie 2004). Variety registration and release was not the goal when a farmer begins to develop rice varieties using a handful of seeds taken from scientific trails, initially without the knowledge of scientists. With the support of fellow farmers, the deviant farmer was successful at challenging the *status quo*. The farmer initiated change – social innovation and entrepreneurship – in the process of developing technological innovation – a new rice variety. The farmer was literally testing not only the variety but the formal breeding processes. In a parallel scenario, insurgents in Nepal tested the parliamentary system joining, walking away and again rejoining the parliament, in their final preparation to secure the landslide victory in the Constitutional Assembly election. It would not matter to the farmer whether his variety passes the test for wider adaptation when he and his colleagues have already adopted the locally selected crop varieties. Subjecting innovations like 'DR Dhan' to modern scientific testing procedures primarily aimed at formal registration and release would create challenges for acknowledging farmers' knowledge and innovation, specifically when scientific knowledge and on-station testing act as the final test for varietal development. Although national listing of farmers' varieties under the provision of the revised crop variety registration and release procedure would be appropriate to protect farmers' rights, testing these locally adapted varieties using the yard stick of modern scientific procedure would limit the uphill battles for community-based participatory research and development. Therefore, policy is neither a necessary nor a sufficient condition for generating and sustaining local innovations among positive deviants, who shape policy as they work along (Ochieng 2007).

Conclusions

Positive deviants from formal public and private organisations and rural communities substantially influence changes in agricultural research and rural development policies, as illustrated in the case of rice improvement in Nepal. Implicitly, the decade-long armed conflict and changes in people's perception on how social and political structures are created throughout the process of human civilisation serve as a leverage to the multi-stakeholder negotiation process for changing agricultural research and rural development policies. These policies may be relatively peripheral to bigger issues in national politics, but locally they are essential to farmers' selection of locally adapted crop varieties for food security and poverty reduction.

The role of positive deviants also enables changes in collaborative research and development interventions. Understanding the positive deviancy of stakeholders from formal and informal sectors can generate new opportunities to manage change, specifically in unfavourable social, political and agroecological circumstances. The need to develop capacity of individual positive deviants will therefore require mechanisms that facilitate the individual and collective intelligence of positive deviants at the organisational, network and system levels. Since different public and private stakeholders would have seemingly contrasting or disjointed perspectives over the same problem, negotiation over such divides would be more useful in the long-term than eliminating alternative view points.

As manifested by the experience of stakeholders in Nepal, policy is a process, and it is important to harmonise policy and practice through interactive learning and innovation. The change management for rural development should (a) identify positive deviants and recognise their individual as well as collective agency, (b) learn from their behaviour in achieving a minimum level of performance despite the lack of enabling environments (policy, infrastructure and peace), and (c) facilitate collective intelligence of such deviants through deeper processes of deliberation among themselves and with inflexible conformists. In other words, the power of uphill battles for community-based participatory research and development lies in knowledge management and capacity development through achieving individual and collective intelligence of positive deviants in formal sector rural service providers and rural communities. The paper concludes that the capacity development of positive deviants from a systems perspective reiterates the problem of how social structure does constrain individual action (for example, creativity and innovation). The future lies however in integrating the philosophy of positive deviancy to appreciate self-determination alongside the peaceful achievement of social goals such as food security and poverty reduction.

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Notes

1. The implicit cause of conflict is identified as social inequality arising from disproportionate allocation of land and other resources (Joshi and Mason 2007). The dependency of peasants on landlords for livelihoods in rural Nepal enabled landed elites to influence peasants to vote for the right-wing parties in parliamentary elections leaving behind Maoists in minority, but insurgency weakened those ties, enabling Maoists to mobilise peasants on their support

2. Two working groups were formed (a) to revise crop variety registration and release procedure, and (b) to raise funds to scale up rice varieties selected and bred using participatory approaches, respectively.
3. A DVD entitled 'Farmers' Variety – Farmers' Right, the story of "DR Dhan"', is available through LI-BIRD (www.libird.org).
4. 'Mother trial' refers to multi-entry, single replicate participatory variety selection (PVS) trial, and 'baby trial' refers to PVS comparing one or two new varieties with existing ones – both are conducted under farmers' input and management (Joshi *et al.* 2005).

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