Reaching distant rural Māori communities in New Zealand through successful research partnerships

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Abstract: *The efficient and sustainable utilisation of Māori land is increasingly seen as essential to promote economic and social development. Traditional agricultural extension techniques have proven largely inadequate. This has prompted increased efforts to develop new participatory approaches. This paper explores the lessons drawn from close to seven years of such work which has brought together both biophysical and social scientists and a large number of different Māori communities. Success was achieved through a partnership to integrate traditional knowledge and western science. The result is the development of a new approach and principles for work with indigenous, marginalised communities.*

Keywords: *Participatory research, traditional knowledge, western science, Māori communities, Māori land, crops, networking*

Introduction

New Zealand's image as a sophisticated, developed agricultural economy deflects attention from the fact that in large part the distribution of its indigenous, Māori population frequently correlates with areas of acute social and economic deprivation (Ministry of Health, 2008). This is particularly so in the more remote areas such as Northland and the East Cape, where Māori population concentrations are characterised by poor health, education and employment. Many *iwi* (tribal authorities) are focusing more on land development as their primary economic asset. This focus is mirrored by many central government initiatives to improve economic and social outcomes for Māori. Collectively Māori own over 1.5 million ha of land. However, an estimated 600 000 ha of this is underdeveloped and average performance levels are generally low relative to comparative non-Māori areas. Māori agricultural output is estimated at only around $700M or about 7.4% of NZ's total agricultural output (Bielski, 2003).

Māori have traditionally shared a special relationship with the land and view it as the source of their cultural, spiritual, emotional and physical well-being. As part of the Treaty of Waitangi process, designed to redress long-standing issues of land alienation associated with European colonisation, more and more land is now being returned to Māori control, thus removing what many commentators view as a core factor that has thwarted development (Durie, 1998 and Matunga, 2000). This continued lag in development has also been explained in terms of other factors. Most Māori land, although held under a wide range of complex titles, remains communally owned. This constrains its use as collateral. Moreover, much of the land is low quality and remote from markets. A drift of Māori from the land in the mid 20th century undermined the population base in rural communities. Associated with this was a loss of a skilled rural labour force (Durie, 1998; Manhire, 2001), and a loss of much of the traditional knowledge associated with land management. Both researchers and land managers increasingly recognise that improving well-being requires approaches where local indigenous knowledge is integrated with (modern) scientific methods to successfully improve and sustain the management of Māori land.

Despite these constraints there are significant successes generally associated with situations where Māori corporations have been established with a commitment to large scale agricultural production.

Extensive sheep and beef production on the Mangatu Blocks Incorporation on the East Coast and the massive dairy enterprise of the Pouakani Incorporation in the South Waikato are notable examples. As yet, however, this success has rarely extended to cropping and other horticulture activities. Māori cropping is estimated at only $17.5M pa (National Māori Vegetable Growers Collective).

This paper explores the development and implementation of a successful multidisciplinary, participatory and cross-cultural partnership, designed to integrate science and traditional knowledge for organic cropping on Māori land. The approach and partnership are described, as is the regional context of the research. The development of the research project is critically reviewed and some guidelines for participatory approaches to indigenous land management are set-out.

A participatory approach

The application of science and technology, seen as underpinning New Zealand's success as a major agricultural exporting nation, is broadly accepted as a key tool in the development of Māori land. Uptake by Māori of modern western scientific practices and agricultural technologies that could support land development has, however, been slow and limited. This is now broadly accepted as a consequence of inadequate communications and extension methods. In particular, most scientists lack cross-cultural experience and participatory skills. This is despite the fact that New Zealand's national policies for science for the last 20 years have been characterised by an overwhelming commitment to users' needs. Indeed, almost all research funding requires evidence of end-user support. This has encouraged a multi-disciplinary, team approach to research, including an increased commitment to participatory approaches, and community partnerships based on mutual respect, designed to share understanding.

Whereas participatory processes have commonly centered on the use of western scientific and technical knowledge, the integration of customary or traditional knowledge (*matauranga Māori*) with western science is now accepted as essential. Established participatory approaches have proven useful in addressing many Māori priority issues such as environment (Allen and Bosch, 1996; Eshuis and Stuiver, 2005)) and public health (Durie, 2004; Jones et al., 2006), but have been challenged in the face of the distinctive characteristics associated with indigenous development. In New Zealand, the need to integrate *matauranga Māori* with western science has grown out of an expanding literature developed in the context of colonisation and Māori theorising of knowledge. This is based on an acceptance that the appropriate way to work in partnership with Māori is closely linked to the need to redress a power imbalance (Barnes 2006). Acceptance of this view includes recognition of the need to integrate previously marginalised customary knowledge within the western scientific paradigm. In effect there is a growing acceptance of the need for an epistemological pluralism as part of establishing appropriate cultural relations and in developing the land (Tipa et al. 2009). In the project discussed here, this was addressed through efforts to develop a partnership between scientists and communities. At a national level this approach has been formally recognised as crucial in designing strategies for science for Māori, and as a means to realise Māori potential (MoRST 2005). This has now been incorporated into New Zealand's research funding priorities.

Science for community change

A research partnership

A research partnership was formalised in a programme "Science for Community Change" funded by the NZ Foundation of Research, Science and Technology (FRST) in 2003. The East Coast Organic Producers Trust (ECOP) whose members are mainly Māori growers of traditional crops in the Tairawhiti region, biophysical scientists from Plant & Food Research, social scientists from The University of Auckland, as well as other individual specialists, including an experienced extension expert teamed up to aid the development of a profitable and sustainable organic industry using participatory approaches. An additional aim of the project was to improve the ability of scientists to work with rural Māori communities. The specific goals were finalised jointly by ECOP and the science

team in 2003 at a *hui* (formal meeting) in Ruatoria: (1) to help East Coast Māori make the transition from extensive agriculture to intensive organic horticulture; (2) to provide scientific, education, and extension services to assist ECOP develop and implement best organic vegetable farming practices; (3) to design methods to promote beneficial change in rural Māori communities and in production systems. ECOP was strongly guided by its original commitment to promote values of *tino rangatiratanga*, *kaitiakitanga* and *whanaungatanga* (respectively, independence, guardianship, and relationships) on the East Coast. There was also a desire to revive the declining cropping tradition among local growers reflected in a mixture of beliefs in the cultural importance of traditional cropping and a desire to provide a positive social and economic example to attract the youth of the community back to the region. This was further backed by a strong belief in the health and environmental principles of organics, which were viewed as closely aligned to traditional cropping practices.

Tairawhiti region

The Tarawhiti district (Fig 1) is a relatively remote and predominantly Māori region with traditionally high unemployment and a low level of economic development. The district covers 8330 square kilometres, almost 5% of New Zealand's total area, with 40,000 ha of rich alluvial river flats, ideal for growing crops. The remainder of the area is mainly hill-country, well suited to farm sheep and cattle. The total population of the district is 45,000, a third of which is spread sparsely throughout the rural countryside or in small townships along the extensive coastline.

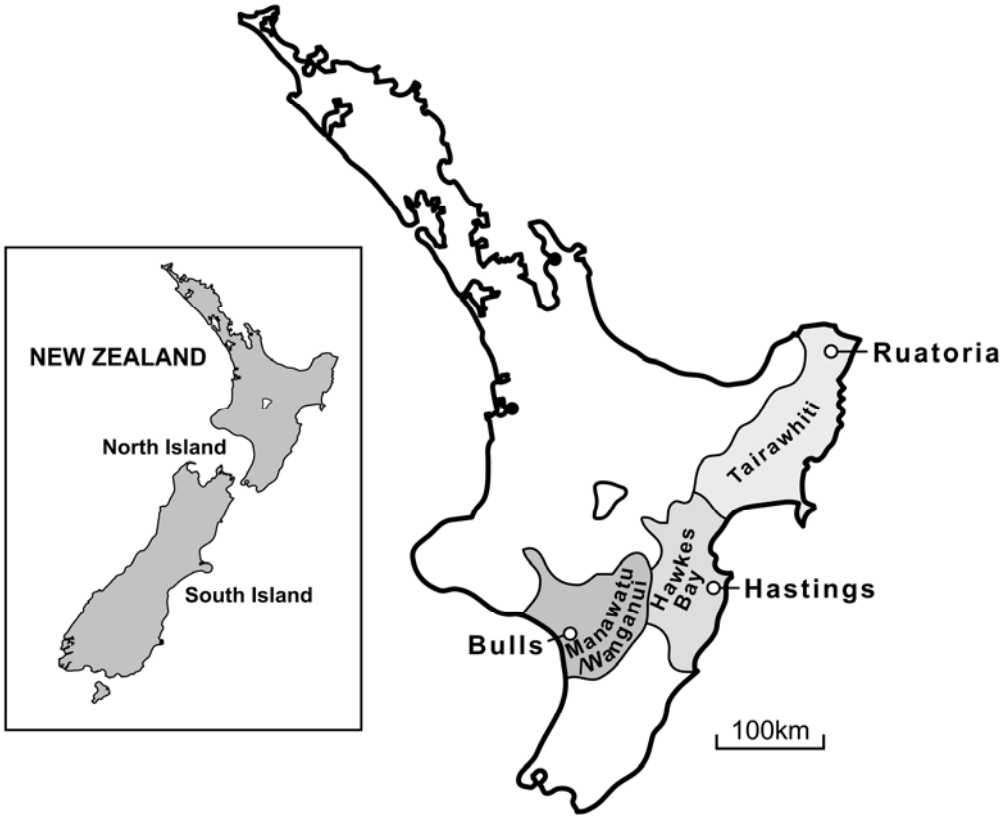

Figure 1. Key project sites.

In 2000, a joint local and central government taskforce was established to promote the development of the region. It concluded that organic production (already practiced on a small scale by some landholders) represented a viable use of under-utilized Māori land and recommended further research into how organics might be further developed in the district. In addition, around 50 organic, most Māori growers with access to land areas ranging from a quarter of a hectare to several hectares formed the East Coast Organic Producers' Trust (ECOP). The Trust involved a scattered population in several different, isolated communities in the East Cape. It produced a Strategic Plan which detailed

their common agreement to develop their land for commercial organic vegetable production with the goal of increasing employment and improving the well-being of their East Coast community.

Traditional crops

Through discussion, scientists and members of ECOP agreed that the best means to realise the goals of the project was to target organic vegetable production using traditional crops, in particular kumara (sweet potato) and Māori potatoes. Both crops are of major cultural significance for Māori. Māori communities have been growing potatoes since the first European explorers brought them to the East Coast of New Zealand around 1769. They are considered as a treasure that has been left to them by their ancestors. These days Māori potatoes have become difficult to obtain, as cultivation had severely declined with the urbanisation of Māori and loss of land, and the ones that had survived were susceptible to many pests and diseases. A major research effort coordinated by the National Māori Vegetable Growers collective (*Tahuri whenua*) aimed to improve the quality, quantity and supply of Māori potatoes has been successful and virus-free lines of several cultivars are now available through their established seed banks. The kumara (sweet potato) is another significant crop. The majority of cultivars are modern varieties (like Beauregard), but some treasured heritage varieties are making a comeback. In addition, vegetables such as Māori spinach (*kokihi*), Māori corn (*kaanga*), fern tips (*pikopiko*), squash, onions and sweetcorn, were all identified by growers as possible options to grow as well. Organic produce were viewed as mirroring traditional practices and having the potential bonus of attracting a price premium that would overcome the costs of transportation to distant urban markets.

The Sequence of Change

The science team provided agronomic advice in response to the needs of ECOP members. At the same time organic crop trials were established on members' land to help them identify those crops most appropriate to East Coast conditions. Several weather stations were introduced into the area. ECOP members also provided informal and formal advice and training to the science team regarding *Māori tikanga* (protocol and traditions). Most project interaction took place through workshops and field walks, which were designed in consultation with the local growers and with both organics and *matauranga* (traditional knowledge) as guiding principles. Local *hui* (meetings) were held at Māori meeting houses throughout the district. The initial focus that emerged through discussion at hui was predominantly on technical issues, including land management and agronomy and topics such as soil fertility, weed management, crop selection and winter cover crops. Other topics were subsequently added, and included market access (e.g. interaction with organic wholesalers outside the district), post-harvest and quality issues (for example, optimising conditions during curing, storage and transport), 'adding-value' to locally grown products and building viable businesses (including marketing, labelling, and food safety). Over time, several topics were revisited to cater for new-comers and for renewed interest within the original group of growers. Some very practical and hands-on tools were developed, e.g. a series of cropping calendars (A2-sized wall-planners) for kumara, Māori potatoes and other crops, the development of a kumara curing cubicle (a low-cost solution to properly cure the kumara after harvest), the development of a mulch-system to enhance kumara growth/yield with additional benefits (for example water saving and weed control). These tools were developed through the strong interactive mindset of all involved, and included traditional cropping knowledge (e.g. Māori moon principles). *Hui*, workshops, field-walks and other forms of interaction, including newspapers, radio and TV were the principal communicating techniques used. Some scientific information was provided in hand-outs as well as newsletters and technical broadsheets, and through the project website.

Despite considerable enthusiasm generated at its inception, the project progressed more slowly than hoped or planned. The number of ECOP members was always uncertain, but from an initial total of around 80 in 2003, dropped to a current active membership of 10-20 growers. At the same time the project had (as planned) attracted other community members not formally attached to ECOP.

Members of the science team describe an initial slow and sometimes frustrating period of trust-building and pressure to demonstrate that science did indeed have something to offer the growers and the communities involved. During the early stages, growers were often reluctant to participate fully in project activities, with low attendance at workshops and field days where community members were at times out-numbered by the scientists. This was frustrating to the science team as workshops were a costly and time-consuming undertaking involving travel times in excess of 5-6 hours each way. Moreover meetings had been arranged after discussion with the community as to the best days and times and designed to address the community's own priority issues. There were many other competing community events and demands from *whanau* (extended family) and *hapu/iwi* ((sub-)tribe), such as multi-day tangi (funeral) which often delayed the execution of necessary cropping practices (such as weeding) for extended periods so that for at least some scientists, the extent of community "buy-in" was seriously questioned. Some minor tensions born of misunderstandings on both sides proved pivotal to the programme but ultimately forced a positive, mutual recommitment to the work. On reflection, the scientists acknowledged that while aware of the challenge they faced with intercultural communications, largely inexperienced in participatory approaches, they had underestimated the new skills and understanding they needed to develop. There was a necessary acceptance that in the effort to advance scientific and technical objectives, some elements of *mataurangi* Māori had been neglected. In consequence the perception had emerged at least among some that the traditional supremacy of western knowledge (and power) had been reasserted. Importantly both sides accepted a shared responsibility. The result was the identification of a community leader/elder (*kaumatua*) within each community to ensure that protocol was properly observed, and an additional series of *hui* where the local community took responsibility to teach the scientists more about *mataurangа* Māori. These changes were agreed as necessary to get the research back on track and restore the power balance between the scientists and community members.

This rebalancing of the power relationship allowed the achievement of several of the project's goals and objectives. Specifically, the project saw: (1) The emergence and subsequent empowering of young Māori growers and entrepreneurs as a result of their exposure to new land use options and market opportunities. Some of these are now community leaders and as rapid adopters of sustainable agricultural practices are now leading by example. (2) The increased exposure of the science team to *mataurangа* (and the explicit acceptance by growers and scientists of the need to strengthen and build on mutual experience and understanding. (3) The substantial extension of networking beyond ECOP into the wider community, evidenced by wider community participation in *hui* and workshops and field-walks; and by individual networking both by Māori growers and scientists. This has significantly empowered the wider communities into cropping activities, evidenced by several community gardens established (4) A major extension of the original research objectives to include products targeting high value, niche markets (for example promotion of Māori potatoes to restaurants, the promotion of novel products like kumara wine, and pickled walnut. This is well beyond the original focus on organic production of vegetable crops.

No precise measurement of the area cropped or volume of produce produced was ever established. Such formal measurement was viewed by the community as an implied questioning of what they already knew. Both community members and scientists agreed, however, the total cropping area significantly increased and on average over the study area has doubled (from approximately 50 hectares in 2003 to 100 hectares in 2008) with many new small paddocks being established for cropping. The volume of produce sold in the East Coast has greatly expanded and niche markets have been established for some crops, including individual varieties of Maori potatoes, kumara, and squash. A formal evaluation of the project at its conclusion in 2008 showed that both scientists and growers characterize their involvement with the project as profoundly positive. All growers felt the project has greatly improved their ability to grow vegetables commercially. Both parties characterized the understanding, trust, and respect that had developed as crucial and there had been an increasing and ongoing sharing of knowledge amongst all parties (Bruges and Smith, 2008).

Although not necessarily a direct product of the Community Change project, several Māori grower collectives have now been established (including the National Māori Vegetables Growers Collective) and most recently new local collectives have emerged around the traditional aspects of growing food crops, and steering away from an initial strong organic focus. However, some ECOP growers successfully gained official organic certification (with organizations like BioGro and Organic Farm New Zealand), but many other (most small-scale) growers decided not to attempt registration as these schemes were too costly with no recognition for the traditional Māori cropping practices. The newly formed grower collectives around traditional Māori cropping have strengthened a revival of traditional Māori involvement in horticulture while maintaining *tikanga* (Māori customs) and the guardianship of and relationship to the land.

The A,B,C,D of participatory approaches to indigenous land management

The Community Change project delivered agronomic outcomes and improved the ability of Māori to grow traditional and other crops profitable, using innovative tools (such as cropping calendars) for Māori potato, kumara and other crops. Field trials, an established scientific approach, in this instance designed in consultation with community members, were found to be a powerful means to foster interaction both with and within communities and to demonstrate and communicate new concepts (such as plastic mulching for kumara cultivation, and virus-free cultivars of Māori potatoes). The information and knowledge accompanying this process was shared through workshops, site-visits and many face-to-face meetings, backed by other communication tools including fact-sheets, newsletters, and websites. Underlying its success was the development and recognition of a 4-step integrated knowledge transfer framework with on-going relationship building and evaluation.

An integrated knowledge transfer framework

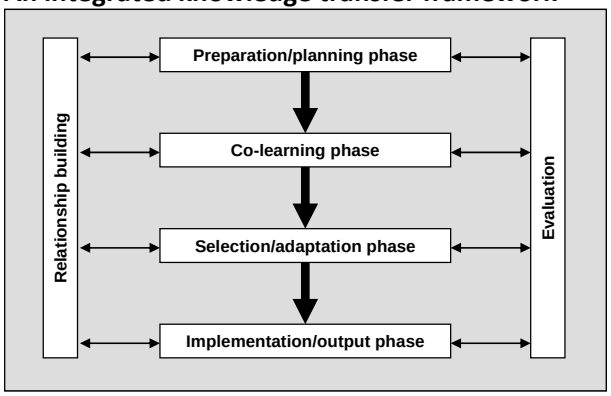

Figure 2. An integrated knowledge transfer framework.

The integrated knowledge transfer framework consists of four main stages (see Figure 2).

(A) Preparation phase ("Preparing the field").

- acknowledge a commitment to work together
- acknowledge clear, mutually acceptable goals;
- acknowledge the strengths and limitations of all parties;
- acknowledge the professional constraints of all parties;
- acknowledge the need for open and honest communication;
- acknowledge that established goals may evolve and change;
- acknowledge the resource constraints facing each group of participants (time, funding, and alike).

(B) Co-learning phase ("Learning together")

- build systems to best monitor and measure success
- build a shared understanding of the skill set of the participants

- build respect for each others' knowledge and world view
- build understanding of different values, attitudes, perceptions and beliefs
- build recognition that participants' goals complement and strengthen the process

(C) Selection/adaption phase ("Being flexible")

- confirm system of experimentation
- confirm monitoring processes
- confirm community commitment to participate in the research process
- confirm mutual understanding of research findings

(D) Implementation/output phase ("Obtaining outputs")

- develop findings as applicable tools
- develop innovations to fit established practices
- develop forms of communication to share new tools with the wider community
- develop, review, celebrate and report achievements
- develop and assess lessons for future work

Central to the success of this methodological approach are the concerted processes of evaluation and relationship building.

Core principles:

- communicate openly
- remember participation is a shared learning
- build trust
- respect differences
- use evaluation to adapt and respond as the process evolves
- recognise evaluation as integral to the total process
- remember success is more than a measure of technology adoption

The new framework differs from conventional approaches by emphasising the centrality of evaluation to the ongoing technology transfer process. Based on the lessons drawn from the Community Change programme, rather than viewing evaluation as a final step, it is an integral part of the transfer process as a whole, allowing ongoing evaluation and revision as the project evolves. It also recognises that evaluation is itself an important outcome of the research, providing lessons for the technology transfer process. This, it is believed, is of particular significance when working with environmental technologies and in a cross-cultural context, where the criteria for evaluation are specific to the relationship between local people and their *whenua* (land). Effectively integrating evaluation provides a more robust and responsive methodological approach, and ensures the increased suitability and relevance of the project outcomes, thus increasing the likelihood of their uptake.

Best of both worlds

A research partnership with several Māori communities

A new and subsequent research programme "Best of Both Worlds – Integrating Western Science and *Matauranga* (traditional knowledge) for Sustainable Cropping" funded by the Foundation for Research, Science and Technology started in 2009. This programme formalizes and extends the lessons from the Community Change programme and is incorporating these in two new regional study areas in the North Island: Ngati Kahungunu –Hastings, Hawke's Bay; and Ngati Hauiti – Rangitikei, Manawatu, as well as in the original study area of Tairawhiti (see Figure 1). The Best of Both Worlds is designed to facilitate the integration of Western science and *matauranga* for sustainable cropping and establish an increasing understanding of agronomic knowledge that will extend across generations. The primary aim is to develop a process of sustainable cropping that can be adopted with Māori groups throughout New Zealand, and at the same time be a process that is self-sustaining (and self-replicating) within the study communities using the ABCD framework.

In the Tairawhiti region a new relationship has evolved with the East Cape Traditional Growers Collective. This collective has only been established recently and formalizes a strong sentiment and confidence amongst Māori growers to recognize traditional horticulture as a point of difference (and advantage) in the market place. This is steering growers away from their initial arguably somewhat narrow focus on organics. This collective together with Ngati and Healthy (a project from a local primary health provider promoting the health aspects) are now jointly involved in establishing community gardens in many small communities on the East Coast to share knowledge and cropping expertise on traditional vegetables. Within the still existing ECOP Trust there several Māori growers are now officially organically certified with formal links to organic wholesalers in several major NZ cities. Others are selling their crops to local farmers' markets, supermarkets and at road stalls.

The way forward

Traditional food festivals to promote Māori produce and food products have been organised as key opportunities to promote and celebrate ways for improving the productivity of Māori land with long-lasting outcomes. Opportunities to further add value are currently being explored, fed by a growing consumer demand both in New Zealand and overseas for 'something different', 'diversity' and 'healthy produce'. Māori potatoes are now promoted to the restaurant market as gourmet potatoes, and novel products including kumara wine and pickled walnuts are extending into wider markets. Most growers now accept that market knowledge (and demand) is central to successful (traditional) cropping. = The cropping calendars developed include pre- and post-harvest guidelines to ensure that crops are produced to meet market specifications. These templates will highlight the regional opportunities for capturing value by controlling the production chain. The net result will increasingly include Māori communities within the broader national economic system and help them access markets, at a local, national and even international level.

As this paper has shown, continued progress remains contingent on the integration of science and traditional knowledge. This requires a partnership between scientists and the community, and that partnership must be built on trust.

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