

Starting E-Business for Farmers in Nepal: Challenges and Opportunities

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Abstract

This study elaborates on current trends in the trading of agricultural products in Nepal and the possibility of implementing ICT for this trading to increase farmers' income. The results show large price differences in agricultural products across regions because of the insufficient exchange of information and a lack of an e-business platform. The results provide important insights into key challenges and offer some important suggestions for e-business success for farmers in rural areas of Nepal.

Key Words: E-business, ICT in agribusiness, online business, online trading

1. Introduction

Nepal is a landlocked, mountainous country in South Asia. The country shares borders with India to the east, west, and south and with China to the north and depends on agriculture for its economy. The agricultural sector accounts for about 65% of the country's active population and about 32% of GDP. Nepal's population in 2015 is projected to be 28,062,832 [1], and 25.2% of the population lies at the national poverty line [2]. Given this, to improve the living standard of the agricultural workforce, it is critical to transform the traditional agricultural business system into an intensified, commercial, and competitive ICT-based business system.

Although many people live in remote areas, the current mobile telephone penetration rate is about 88.90%. Among mobile telephone users, about 37.84% have smart phones because they access the Internet using those devices. Although the internet penetration rate is only about 40.37% [3], it is sufficient for e-business. There are many PCOs and private cybercafés (PC rooms) in many remote areas. In this regard, this study introduces the notion that the income level of farmers can be improved by educating them about ICT and encouraging them to use e-business for their agricultural products. Here agricultural products refer to all products from the agricultural sector, including horticultural, dairy, livestock, beekeeping, and edible forestry products as well as any products raised or produced on farms.

2. E-business in Nepal

Decade ago, many offline entrepreneurs started the e-commerce trend in Nepal. Their services were basically for overseas Nepalese communities, and the goal was to encourage overseas Nepalese communities to buy gift items for their families or friends back home. In the late 1990s, some online entrepreneurs entered the field and started online trading, including international money transfers to Nepal. These businesses saw little success in the domestic market and were limited to overseas transactions. As a result, the scale of such businesses showed minimal increases from several obstacles, including infrastructure problems and social and legal boundaries. At this time, many department stores and some online-only stores started offering online products and services. These online stores focused mainly on a few large cities.

Recently, Nepalese lawmakers have tabled a draft of a long-awaited revision to the constitution in the constitutional assembly and are expected to promulgate a new constitution in the near future. The administrative structure is likely to change with the new constitution, but administratively, Nepal is currently divided into 75 districts. All the headquarters of these districts are small cities, and in these headquarters, the Government of Nepal (GoN) has developed basic infrastructure systems such as telephone/internet services, electricity, roads, and banks. The purchasing power of people living in district headquarters has exceeded that of those in rural areas.

Districts are further divided into village development committees (VDCs), municipalities, metropolitan cities, and sub-metropolitan cities. There are currently 3,625 VDCs, all of which are connected through telephone/internet services. In addition, all VDCs now have WiMAX systems installed and are in the process of distributing high-speed internet services [4].

If these technologies are easily accessible by farmers, then they may bring about a new wave of growth for rural farmers' socioeconomic status. In addition, these technologies would be better adopted by farmers if there is sufficient investment to establish efficient online/mobile e-business services by reputable/trustworthy firms targeting farmers. Along with other advantages of online business, the following factors provide the reason why people, particularly in Nepal, prefer online transactions to offline ones if they have an option to buy online and understand online transactions.

i) **Products directly from farmers:** These days, people are very concerned about their health. In Nepal, there is no effective government health insurance policy, and everyone wants to save money for potential medical treatment. Hospitals are expensive and not reliable in some cases. Therefore, people want to take precautions and want to eat healthy food items. As of 2011, the food adulteration rate in Nepal was 15.6% [5]. Buying directly from farmers may be one of the best ways to avoid adulteration. In addition, many people with high purchasing power have smartphones and thus represent potential buyers of products from farmers. Therefore, online consumers may be a key market segment for farmers.

ii) **Good product value:** Many farmers have to go to cities to sell their products. However, they cannot get good prices because the same products are generally offered by farmers from the same region. That is, because supply exceeds demand in nearby cities for products grown nearby, farmers are focused to sell at low prices. On the other hand, demand may exceed

supply in cities farther away for those same products, and therefore farmers may get better prices by supplying their products in those cities. With the help of some mobile apps, farmers can compare prices between their city and another and determine the level of demand for their products across Nepal or in Indian cities near Nepal-India borders. In this way, consumers can save money by shopping online, and farmers can get better prices for their products.

iii) Greater variety: Nepal includes Terai, Hill, mountain, and trans-Himalayan region, and each region has a different climate condition. Therefore, there are different crops in different regions. In addition, because from the east-west distance is about 800 km, there are different crops in the same tropical regions, and the price and demand vary for agricultural products across regions. Here a win-win scenario can be achieved for both consumers and farmers if the latter can be connected to consumers in different regions. Consumers can obtain a wider range of products, and farmers can get better prices for their products.

iv) Time saving: Many busy consumers who live in cities have no time for offline shopping. However, they have access to the Internet, and therefore they represent potential buyers of products directly from farmers. On the other hand, many farmers have to travel long distances to buy seeds, fertilizer, and farming tools/equipment, and therefore once they learn the use of online shopping, they can save time and money when ordering required products.

v) Lower cost: As discussed later, even after including delivery fees, some agricultural products are far cheaper than the same product in the local market. If consumers can buy in bulk, the delivery cost can be sharply reduced, and they can thus get products cheaper. This then would encourage and support the delivery/transportation industry.

vi) No crowd: In large cities such as Kathmandu, Lalitpur, Pokhara, and Biratnagar, department stores and traditional markets such as Ashon and Thamel in Kathmandu are crowded. There is traffic jam, and there are almost always parking problems in traditional markets. There is also the possibility of theft and sexual harassment. Therefore, people do not always want to go shopping at these markets. On the other hand, there is no crowd in online shopping. Many people who have no time to go out or do not prefer it are likely to buy online.

vii) Spend less for travel: The travel cost is high in Nepal in comparison to that in countries with similar per capita income. Gasoline is expensive at around NRs 130.47 per liter [6]. Not many people own cars, and the taxi fare is high. In addition, taxis are not easy access in many cities and at certain times.

viii) Lower taxes: Nepal has several agricultural products for which the GoN imposes low or no taxes, including dairy products. If the GoN reduces or exempts taxes for online customers of farmers, then many consumers are likely to buy online, which in turn can motivate more farmers to sell online.

ix) New things to try: Farmers and consumers have used traditional business systems for years, and therefore they may be willing to try new methods.

3. Current trends in agricultural product delivery to consumers in Nepal

Traditionally, farmers have less direct access to retailers and consumers. Farmers sell their products through middlemen, suppliers, or wholesalers, and in general, they sell their

products to middlemen who sell to wholesalers. Wholesalers then sell to retailers to finally reach consumers. There may be one or many middlemen, and middlemen and wholesalers sometimes resort to QoS or adulteration processing for increased profitability. This type of traditional process has been in place for a long time, even for cash crops dairy, and livestock.

Some online markets have recently started to offer vegetables and food grain supply services but are not focused mainly on farmers. These online stores are limited to young and trendy buyers in a few cities. As in the case of traditional offline markets, most products offered by these online stores come from middlemen, suppliers, or wholesalers. These online stores buy products from offline stores and sell online. In many cases, these online stores sell at even higher prices than traditional markets [7].

Some initiatives to share information online on market prices of agricultural products have been implemented to benefit consumers, but this has not achieved much popularity among farmers [8-10]. If the number of middlemen can be reduced by facilitating the sharing of information between consumers and farmers, then the latter can take advantage of better prices, and consumers can receive fresh/unadulterated food items at reasonable prices.

4. Challenges in starting online services for farmers

Some challenges limiting ICT implementation for farmers include the following:

In general, farmers do not produce a large volume of products, have difficulty accessing ICT platforms, and have limited knowledge for starting their own websites. Therefore, the GoN, communities, and firms must invest in such a business system to help farmers and explore new opportunities.

ICT-related industries are generally based on electricity. Although, Nepal has the huge potential to produce hydroelectric power, it still facing electric power shortage problem. Electrical lines are installed in most VDCs, but there is still no 24/7 electricity supply even in large cities.

One of the main reasons for little investment in ICT in Nepal is political instability. Investors are adamant about investment security and guarantees on return of investment.

Online payment systems are not well established. There are a growing number of payment gateways, but they are limited by legal and security issues. Online transfers to the same bank are readily available, but it remains difficult to transfer online in different banks.

One of the main reasons investors are not interested in online entrepreneurship is that there are only a small number of internet users. Farmers are not educated in e-business, and many have no access to the Internet, computers, and smartphones. Although broadband internet services are increasing gradually, they remain poorly established in the country.

Banks and agencies do not issue credit cards to the general public, and not all financial institutions issue debit cards. There are only a limited number of ATM machines installed. The Ministry of Science, Technology, and Environment has declared an ordinance on online activities for the authentication and regularization of cyber activities. The law is still be implemented for online trading.

Because online B2C business remains in its infancy, there is a large trust gap between consumers and firms. Many people prefer offline stores and buy only after seeing, touching,

and feeling products. Although there are some B2B transactions among traders, these transactions are for well-established brands such as those electronic and construction material products. On the other hand, sellers remain unfamiliar with the online behavior of online buyers and have yet to accept purchase returns.

There is no efficient delivery and reverse-delivery system. The delivery industry and the e-business industry work separately.

5. Observations

To check the feasibility of e-business for agricultural products, market prices in different cities were evaluated using the Tarkari app in the Android operating system. The app provided price information from a price list provided by the GoN, the Ministry of Agricultural Development, and the Agribusiness Promotion and Marketing Development Directorate (APMDD). The APMDD provided wholesale prices in 10 cities of Nepal by the short message service (SMS), the application programming interface (API), and websites [11]. All data in these analyses were observed for 45 days from April 1, 2015, to May 15, 2015, and averaged.

Fig. 1 shows the prices of bitter gourd, cabbages, capsicum, chilly, cucumbers, and tomatoes in four cities located in diversified geographic locations from Nepal's far eastern region to far western region. Fig. 1 shows large price differences across these cities. Prices in some cities were 50% lower than those in others.

In fact, these prices were offered by suppliers, and therefore actual prices of farmers could have been even lower. These price differences were due to supply and demand and production costs. As described in Section 2, Nepal has four distinct geographic regions: Terai, Hill, mountain regions, and the trans-Himalayan region. Each of these regions has a distinct climate, and therefore different crops are cultivated in different regions. In addition, supply and demand conductions for agricultural products vary according to the season.

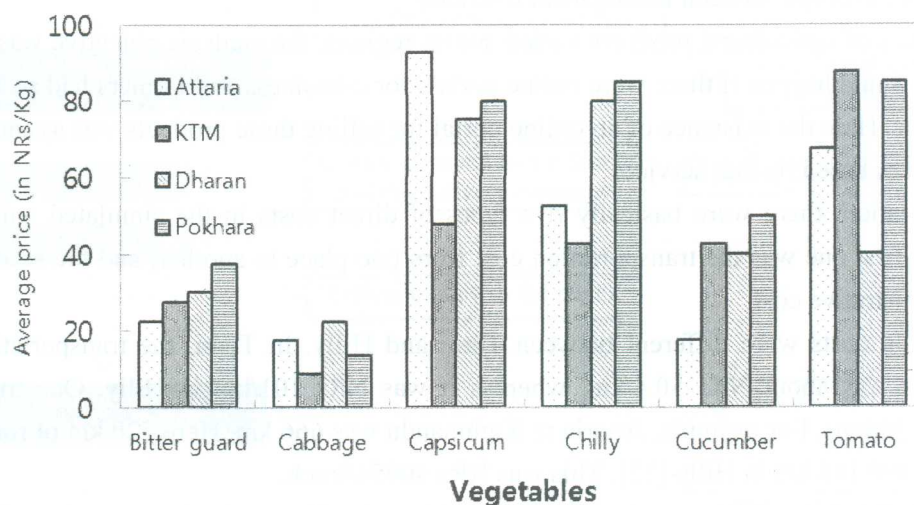


Fig. 1. Average wholesale prices of vegetables across cities of Nepal

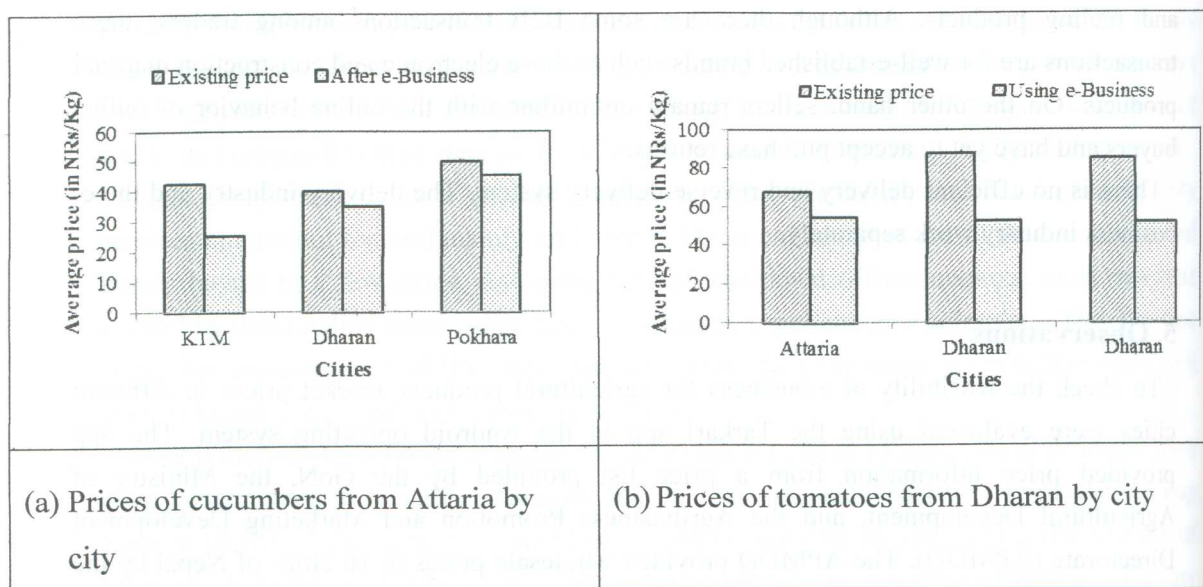


Fig. 2. Prices of vegetables with and without e-business (20% administrative cost added for e-business).

Prices of agriculture products also depend on production costs. For example, the production cost of potatoes in Dhading was NRs 1082.63/quintal, and that in Nuwakot was NRs 1288.65/quintal. The market value of potatoes in Nuwakot was NRs 20.50/kg, whereas that in Dhading was NRs 27.20/kg.

Net profits per hectare in these two districts in the fiscal years 2013/2014 were NRs 312715.29 and NRs 106432.84, respectively. The net profit per hectare in Dhading was about three times that in Nuwakot because the production cost per hectare in Nuwakot exceeded that in Dhading but market value was lower [12]. These two districts were adjacent to each other, and they bordered Kathmandu, the capital city. There could have been even larger production cost differences in crops between nonadjacent districts.

Because prices of agricultural products varied across regions, the analysis objective was to analyze what would happen if there were online portals for e-business and farmers had access to those portals. Here the existence of an online portal for selling these products was assumed to analyze prices based on that service.

In this simulation, there were basically two types of direct costs in the simulated online business. The first one was the transportation cost from one place to another, and the second was the administrative cost.

Transportation costs were different between Terai and Hilly. In Terai, the transportation cost per truck was about NRs 50.4/km, whereas it was NRs 101/km in Hilly. One truck carried about 10 tons. For example, Attaria to Kathmandu was 666 km. Here 520 km of roads was in Terai, and 146 km in Hilly [13]. This was NRs 40954/truck.

Fig. 2 shows the price differences in vegetables with and without e-business services. Fig. 2(a) shows that the price of cucumbers in Attaria was NRs 17.5/kg, whereas that in Kathmandu was 42.5/kg. A cucumber farmer in Attaria could sell to buyers in Kathmandu by using the e-business portal. The price of cucumbers sent from Attaria to Kathmandu under an

assumption of a transportation cost of NRs 4.1/kg and a 20% administrative cost would be just NRs 25.1/kg. This was 41% lower than the offline market price in Kathmandu. A similar scenario is shown in Fig. 2(b). The price of tomatoes in Dharan was NRs 40/kg, and that in Pokhara was NRs 85/kg. Even after including all costs for a door-to-door service from Dharan to Pokhara, the price was NRs 51.6/kg, which was 39% lower than the offline price in Pokhara.

Although transportation firms are generally not interested in small cargos, once e-business takes off, many are likely to accept small packs (5 kg or 10 kg or even smaller). Even after adjusting prices, farmers would still receive better prices for their products and gain a wider range of customers in conjunction with the other advantages described in Section 2.

6. How products can be effectively supplied to consumers' doorsteps

Farmers generally have little IT knowledge, and therefore e-business websites should be user-friendly. Both farmers and customers have to open accounts at portals of e-business service providers (ESPs). For example, they can take photos of products using mobile cameras and upload them, and they can select prices from a dropdown menu and write comments. In addition, farmers can take photos of products and visit district/VDC headquarters to upload them if it is not easy for them to upload pictures by themselves. Further, cybercafé employees can help to upload products. Sellers and farmers have to agree on terms and conditions according to ICT rules and regulations, and customers have to agree to the ESP decision in case of minor farmer-customer disputes.

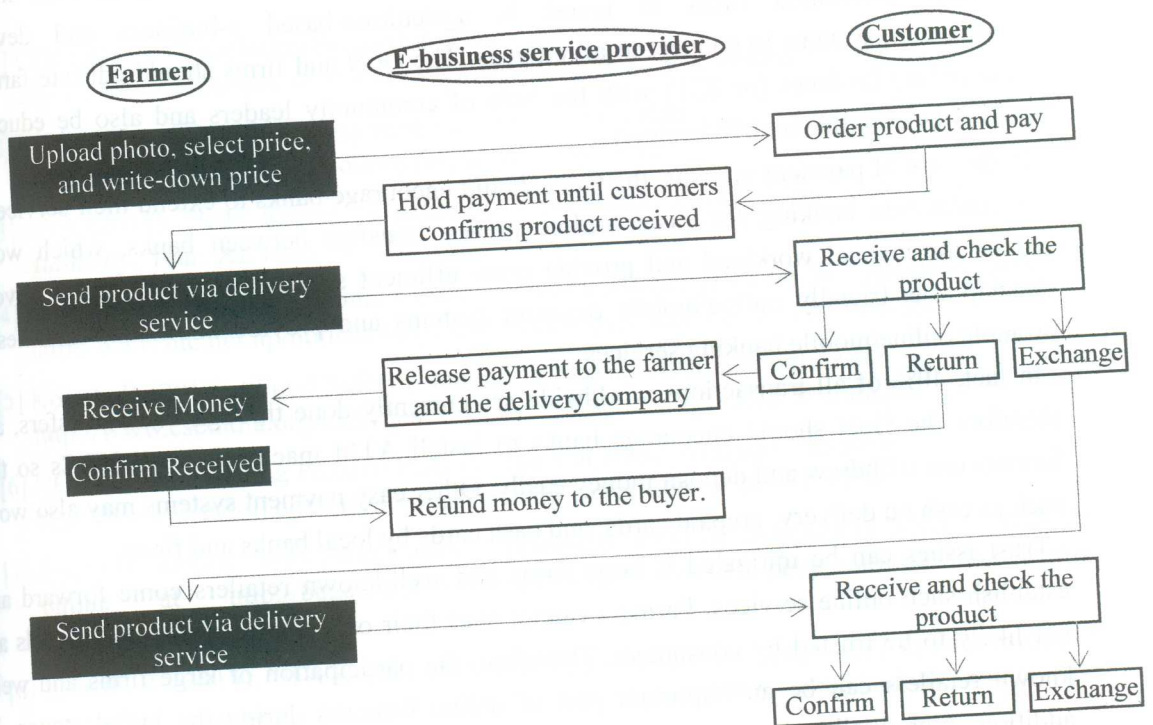


Fig. 3. An e-business model for farmer-to-customer delivery services

Customers can order products and pay using bank transfers or any other form of payment. Money is then deposited in the ESP's account, and farmers send products to customers through delivery services. Customers indicate products received by using their mobile phones or PCs, and the ESP sends money to accounts of farmers and delivery firms. If a customer does not indicate the receipt of a product, then the money is deposited in the farmer's account after a week of delivery.

In the case of the delivery of a wrong product or a gap in the quantity or quality of a product between what is received and what is described on the website, the customer can return the product, and the farmer is responsible for the delivery charge. Customers can ask for money back or the delivery the correct product. If a product cannot be returned, then the farmer has to clearly mention it in product details. Fig. 3 shows this process.

7. Discussion and suggestions

Nepal produces about 4,000 ICT graduates every year [14]. Because of low investment in ICT-related industries, many go abroad for jobs or further academic work. The GoN has attempted to change the existing FDI structure to increase FDI in various sectors. In the IT sector, there is no limitation in equity ownership, and a firm can be owned up to 100% by a foreign firm or individual. The GoN has tried to establish export promotion zones (EPZs) and special industrial districts (SID) such as IT parks in various parts of the country. The new Foreign Investment Policy of 2014 (draft) is currently under consideration by the GoN for substantial amendments [15].

To promote living standards for 65% of the total agricultural workforce, the GoN should encourage e-business firms to invest in agriculture-based e-business and develop infrastructure systems to connect to all citizens. The GoN and firms should educate farmers about online business (or ICT) with the help of community leaders and also be educated about risks of online/mobile business.

In the case of payment systems, the GoN should encourage banks to extend their services to internet/mobile banking for easier online money transfers between banks, which would reduce the manual workload and provide more efficient services to users. Banks have to develop user-friendly online/mobile payment systems and provide additional facilities to promote online/mobile banking services.

In fact, 40% of all transactions worldwide are currently done through bank transfers, and therefore the GoN should encourage banks to install ATM machines in all VDCs so that farmers can withdraw and deposit money easily. Other easy payment systems may also work, such as cash on delivery, prepaid cards, and cash cards by local banks and firms.

Trust issues can be mitigated if large firms and well-known retailers come forward and establish such online services. Farmers cannot start their own portals, and small portals are not likely to be trusted by consumers. Therefore, the participation of large firms and well-known retailers can be an important part of online business during the initial stages. In addition, high-quality customer service can help establish trust between consumers and suppliers.

The GoN should revise the existing tax policy and reduce tax burdens on online business for

a certain period of time to encourage both buyers and sellers to be more involved in e-business. Legal issues in e-business should be resolved in the near future, and online transactions and online consumers' protection should be guaranteed. Further, online fraud prevention methods should be implemented.

During the initial stages, employees providing customer or after-sales service should be trained to have maximum tolerance toward customers' complaints.

8. Conclusions

This study provides valuable insights into the potential of online business involving agricultural products in Nepal. This business is necessary to enhance farmers' living standards through direct transactions between farmers and consumers. In addition, it can support the delivery industry, online entrepreneurship, and online/mobile/electronic banking while reducing the food adulteration rate and increasing the consumption of healthy food items.

With proper training and education, people of all ages can be motivated to consider e-commerce, which can improve the income level of farmers and provide consumers with good value for money. In addition to these advantages of e-business, Nepalese products can be promoted at the global level. Investing in e-business based on the agricultural or natural resource sector is likely to provide a good return of investment even in developing countries such as Nepal.

References

- [1] CBS (2011), "Population Projection 2011–2031", *Central Bureau of Statistics*, Government of Nepal, Volume 08, NPHC 2011.
- [2] WDI (2015), "World Development Indicators," Available: <http://data.worldbank.org/country/nepal>, 21 May, 2015.
- [3] NTA (2015), "MIS Report 13 February – 14 March, 2015," *Nepal Telecommunications Authority*, Year: XI, Issue 76, Vol. 124, June 10, 2015
- [4] NTC (2015), "The 6th Annual General Meeting Minute 2014-06-24," Available online at http://www.ntc.net.np/notices/6th_agm_minute.pdf, accessed on 2015-06-23.
- [5] Koirala P. (2012), "Food Safety Situation in Nepal," Available online at http://www.cseindia.org/userfiles/food_safety-march12/pramod_koirala.pdf
- [6] NOC (2015), "Selling Price of POL Products in NRs," Available online at <http://www.nepaloil.com.np/Selling-Price/13/> Accessed on 2015-06-23.
- [7] Joshi GP (2015), "Why people are not interested in online shopping in Nepal?" Available online at <http://bagalamukhi.blogspot.kr/2015/06/why-people-are-not-interested-in-online.html>
- [8] Isabella R. (2015), "IFA Krishi: an Android app designed to empower Nepali farmers," *e-agriculture*, January, 2015. Available online at <http://www.e-agriculture.org/news/ifa-krishi-android-app-designed-empower-nepali-farmers>
- [9] Tarkari (2015), BigFoot Software, Available online at <https://play.google.com/store/apps/details?id=com.adhikari.tarkari>

- [10] APN (2015), Available online at <http://www.agripricenepal.com/nep/index.php>
- [11] AB ((2015), Available online at <http://www.agribiz.gov.np/>
- [12] Bhandari N.B. (2014), "Cost of Production and Marketing Margin of Cereal, Cash, Vegetable and Spices Crops In Nepal (2013/2014)," *Agribusiness Promotion & Marketing Development Directorate*, Ministry of Agriculture and Cooperatives, Government of Nepal, June 14, 2014. Available online at http://www.agribiz.gov.np/downloadfile/Cost%20of%20Production%20Book%202071%20setup_1427890992.pdf
- [13] FTTEN (2015), "Public Carriers Rent Price," *Federation of Truck Transport Entrepreneurs*, Nepal Available online at <http://www.ftten.org.np/>
- [14] Pandey S.P. and Shrestha B. (2010) ".np," Digital review of Asia Pacific, 2009-2010
- [15] Paudel M. (2014), "Legal Framework of Foreign Investment in Nepal," Available online: http://www.nepembseoul.gov.np/uploads/files/document/Legal_Framework_of_Foreign_Investment_in_Nepal_24.pdf

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