



USAID FIRMS PROJECT

Economic Benefits of Provincial Livestock Policy Reforms

July, 2012

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Data Page

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Abstract:

In light of the Provincial Livestock Policy Reforms proposed by the FIRMS Project, a suitable model has been developed to calculate the probable economic benefits accruing out of these policy reforms. The policy reform framework proposed specifically for Punjab has been made the basis of analyses. Projections have been made for certain impact indicators by finding appropriate variables for quantification of impact. The model provides quantitative information by linking the policy reforms and the impact indicators on the basis of certain assumptions.

Acronyms

| | |
|-------|----------------------------------------------------|
| AI | Artificial Insemination |
| AH | Animal Husbandry |
| BI | Breed Improvement |
| FY | Fiscal Year |
| GDP | Gross Domestic Product |
| GoP | Government of Pakistan |
| Halal | Islamic Law Permissible Food Designation |
| KPK | Khyber Pakhtunkhwa |
| L&DD | Livestock and Dairy Development Department |
| LS | Livestock |
| MTBF | Medium Term Budgetary Framework |
| MTDF | Medium Term Development Framework |
| SoW | Scope of Work |
| USAID | United States Agency for International Development |
| Y | Income |

Table of Contents

| | |
|---------------------------------------------------------------------------------------|-----------|
| 1.0 INTRODUCTION..... | 1 |
| 1.1 OVERVIEW OF PUNJAB LIVESTOCK SECTOR | 2 |
| 1.1.1 PUNJAB LIVESTOCK POTENTIAL | 2 |
| 1.2 LIVESTOCK PROFILE: BALOCHISTAN AND SINDH | 4 |
| 1.3 DAIRY SECTOR | 6 |
| 1.3.1 MILK’S CONTRIBUTION TO THE LIVESTOCK SECTOR – SUPPLY SIDE..... | 6 |
| 1.3.2 MILK USAGE – DEMAND SIDE | 7 |
| 1.3.3 YIELD OF MILK COMPARISON:..... | 8 |
| 1.4 MEAT SECTOR | 8 |
| 1.5 DISTORTIONS AND INEFFICIENCIES IN THE LIVESTOCK SECTOR | 9 |
| 1.6 REDRESSING INEFFICIENCIES THROUGH POLICY REFORMS..... | 9 |
| 2.0 STUDY METHODOLOGY | 11 |
| 2.1 CALCULATING ECONOMIC BENEFITS OF POLICY REFORMS | 11 |
| 2.2 METHODOLOGY | 12 |
| 2.2.1 ECONOMIC BENEFITS FROM DISEASE SURVEILLANCE AND CONTROL:..... | 13 |
| 2.2.2 ECONOMIC BENEFITS FROM BREED IMPROVEMENT, R&D AND EXTENSION SERVICES | 15 |
| 2.2.3 ECONOMIC BENEFITS FROM LIVESTOCK MARKETING AND INFRASTRUCTURE DEVELOPMENT | 17 |
| 2.2.4 ECONOMIC BENEFITS FROM MEAT PROCESSING AND MARKETING | 17 |
| 2.2.5 OVERALL IMPACT ON GROSS DOMESTIC PRODUCT (GDP)..... | 19 |
| 3.0 CONCLUSION | 20 |
| 4.0 REFERENCES..... | 21 |

List of Tables

| | |
|----------------------------------------------------------------------------------------------|----|
| Table 2: Punjab Livestock Sector Statistics | 2 |
| Table 3: Livestock Production | 4 |
| Table 4: Production of Livestock Products | 4 |
| Table 5: Livestock Situation in Balochistan | 5 |
| Table 6: Livestock Population in Sindh..... | 5 |
| Table 8: Input- Output Impact Calculation Model..... | 11 |
| Table 9: Calculating Benefit through Increased Production (Milk & Meat) | 15 |
| Table 10: Calculating Benefit through Increased Exports | 17 |
| Table 11: Calculating Benefit through Increased Per Capita Availability (Meat and Milk) | 18 |

List of Figures

| | |
|---------------------------------------------------|----|
| Figure 1:Productions of Milk and Meat | 16 |
| Figure 2: Exports (Meat & Meat Preparation) | 18 |
| Figure 3: Livestock Contribution to GDP | 20 |

Executive Summary

LIVESTOCK as a sub-sector of agriculture contributes significantly to the health and economy of Pakistan. However, there is evidence that the livestock industry potential is constrained by distortions and inefficiencies introduced on the part of current institutional, legal and regulatory policies. The legal and institutional framework of livestock is not based on a sound policy premise; therefore, the full potential of the provinces is not being exploited. With this backdrop, the present policy reforms proposed by the USAID Firms Project mark the beginning of a renewed effort of bringing this sector into the limelight before key stakeholders and presenting plausible ways through which the government can gear up in its pursuit of tapping the maximum potential of this sector and actualizing on the possible gains.

The main objective of the report is to develop a model whereby economic benefits of policy/regulatory and institutional reforms proposed by the USAID Firms Project can be quantified and subsequently assessed. The provincial livestock policy framework developed for Punjab by the Firms Project has specifically been made the basis of subsequent analyses. The interest lies in the determination of whether or not the proposed policies can benefit the target groups; and how these will ultimately improve their welfare. This involves impact assessment along with quantification of socioeconomic and institutional factors influencing the livestock sector. The challenge lies in identifying suitable variables corresponding to each area of policy reform through which a quantifiable evaluation can be made. For this purpose, an “Input-Output Impact Calculation Framework” has been developed which lays down how the proposed interventions (inputs) are expected to have effect on probable outcomes (output), by establishing a link between input and output on the basis of certain assumptions.

The provincial livestock policy framework proposed by the USAID Firms Project adapted a series of principles from international experience in Chinese and Australian policy setting. These principles are listed as follows:

- Elimination of market distortions through restriction on competition
- Creation of a demand-driven approach to markets
- Recognition that there is a cost for goods and services
- Elimination of resource allocation distortions through public ownership of business entities
- Representation for stakeholders in industry decisions
- Industry self-regulation
- Independence of regulatory bodies
- Sustainable use of resources
- Independent policy for social and economic disadvantage
- Recognition of cultural attitudes

Using these principles, policy reforms have been proposed in following areas:

- Disease surveillance and control
- Disease Treatment
- Vaccine production
- Feed production and monitoring
- Extension services
- Breed improvement
- Research and development
- Livestock Marketing
- Meat processing and marketing
- Commercial livestock production
- Animal welfare
- Environment
- Rangeland management

In order to help fully understand the economic significance of the proposed reforms, a need was felt by the USAID Firms Project to develop an economic model to quantify the impact of these reforms on the economy. It was believed that this would lend credence and support to the implementation of these reforms. With this backdrop, the input-output impact calculation framework thus developed provides forecasts of annual economic benefits from these policy reforms. To keep a realistic approach and in order to arrive at conservative estimates, past trends of livestock specific economic variables have been utilized. After calculating the percentage change in years 2010-2011/2011-2012, criterion for calculating minimum achievable gain has been applied. This criterion is as follows;

Min Achievable Benefit/Gain: value of output derived by assuming that there is an “incremental” (additional) contribution proportional to one-third of the percentage change calculated for each economic variable.

The minimum achievable gain criterion itself has been based on the premise that any policy reform is bound to have an impact over and above the past trend.

Following are the results of the economic model thus developed:

- Contribution of livestock to GDP can increase to a minimum of 16.6% subject to the successful implementation of the proposed policy reforms.
- The per capita income of people associated with livestock can increase by \$65.85.
- Exports of meat and meat preparation can increase by a value of \$30.16 million
- Livestock population can be expected to grow by 88.21 million no's.
- Recovery of milk post production losses can add \$ 1.8 billion to the sector's credit.

- The per capita availability of meat and milk can account for an economic benefit in the form of 0.86kg and 0.27 liters, with a projected increase of production of meat and milk by 2076.28 thousand tons and 190.69 thousand tons respectively.

1.0 Introduction

Agriculture is the backbone and single largest sector of Pakistan's economy with a significant contribution of 21% to the GDP. Livestock is an important sub-sector of agriculture and accounts for 55 percent of agricultural value addition and about 11.6 % of the Pakistan GDP. It also comprised of 8.5% of total national export in 2011-12.¹

Apart from its contributions to national income, the livestock sub-sector is an active employer of thousands of landless poor and subsistence and semi-subsistence small farming families. The role of livestock sector in the rural economy of Pakistan is very critical as about 35 million rural populations are raising an average holding of 2-3 cattle/buffalo and 3-4 sheep/goat per household with a contribution of 35-40 percent in their incomes². Being a household activity, women are a special beneficiary of employment in this particular sub-sector. It is a major source of meeting the nutritional needs of masses. Livestock products and by-products such as milk, eggs, butter, oil and meat add immensely to the health, nutrition and well-being of rural as well as urban people. Apart from this, many products of livestock origin such as wool and wool products, and in particular, leather and leather made-ups and animal casings are exported and contribute to the foreign exchange of the economy.

Livestock is undoubtedly an important livelihood asset for the rural population. It not only acts as a buffer against adversity but generates ready cash to meet most of the social obligations and farm needs of the rural populace. It is generally being noted that the rural landless and poor are shifting to livestock production in the wake of a decreased availability of jobs that match with their skills. As such, the livestock sector has been absorbing a significant portion of local unskilled labor for a long time, and remains a major source of income for such workers.

Although the agriculture sector's performance has been weak over the last few years, recording a growth of about 2% per year, the livestock sector has not followed suit and instead, has remained healthy with a growth rate of 4%, which was equal to the set target.³ It follows from the above that the livestock sub-sector is likely to maintain its position as the dominant sub-sector of Pakistan's agricultural sector or even that of the national economy for quite some time in the future. However, despite the rising and critical importance of this sub-sector, one finds no substantive corresponding emphasis on analyzing its achievements, problems and future prospects in order to come up with policies to brighten these up.

It is yet for many of us to understand if we have really touched the core depth of potential inherent in the livestock sector. Statistics point towards an overwhelming economic value attributed to this sector while providing more than 50% of agricultural output from estimated total assets of US \$19 billion⁴, but critics, policy makers, analysts, economists alike believe that we are still far behind than what we ought to reap out of this sector and thus a paradigm shift is required to actualize the possible gains from this sector. With this backdrop, the present policy reforms suggested by the USAID Firms Project mark the beginning of a renewed effort of bringing this sector in lime light before key stake holders and presenting plausible ways through which the government can gear up in its pursuit of tapping the maximum potential of this sector and actualizing on the possible gains.

¹ Economic Survey of Pakistan, 2011-12

² Punjab Livestock Sector Profile, PBIT

³ Economic Survey of Pakistan, 2011-12

⁴ Ian Auld, Provincial Livestock Policy Framework; USAID Report

1.1 OVERVIEW OF PUNJAB LIVESTOCK SECTOR

Punjab, being the most populous province of Pakistan, is progressively becoming a more significant player on Asia's economic map. Punjab is largely a self-sustaining, agrarian province with an abundant produce of food crops and livestock; it has historically posted the highest production numbers for rice, wheat, dairy and meat in the world. Punjab offers a large market size with a skilled and cost-competitive labor force; strategically advantageous location in Asia; good infrastructure; a rich fertile land complemented by four seasons; and the highest literacy ratios in the country with major cities having literacy ratios of over 70-80%⁵.

Table 1: Annual incomes from different sources (Punjab)⁶

| | |
|----------------------|-----|
| Livestock Products | 37% |
| Crops | 33% |
| Salaries/remittances | 29% |
| Others | 1% |

1.1.1 Punjab Livestock Potential

The agriculture sector has a large share in Punjab's economy. In 2007, it accounted for about 28% of the province's GDP and provided jobs for 44% of the labor force. Moreover, the economies of rural areas of Punjab, where Punjab's poor populations are concentrated, depend to a large extent on agriculture. Livestock accounts for 50% of agriculture in Punjab.⁷ It makes an important contribution to the socio-economic development of rural households and has a significant positive impact on poverty alleviation.

According to livestock census 2006, 52% of the total cattle population of Pakistan resides in Punjab, 19.7% in Sind, 20% in KPK and 8% in Baluchistan.

Table 2: Punjab Livestock Sector Statistics⁸

| | |
|-------------------------|----------------|
| Total Population | 180.71 Million |
| Rural Population | 113.16 Million |
| Urban Population | 67.55 Million |
| Union Councils | 3500 |
| Veterinary Hospitals | 548 |
| Veterinary Dispensaries | 1447 |
| Veterinary Centers | 1589 |

⁵ Punjab Livestock Sector Profile, PBIT

⁶ Punjab Livestock Sector Profile, PBIT

⁷ Punjab Livestock Sector Profile, PBIT

⁸ The table gives latest figures compiled from following sources:

Punjab Livestock Sector Profile, PBIT

L&DD, Punjab

Punjab Development Statistics, 2011

Economic Survey of Pakistan, 2011-12

| | |
|--------------------------------------------|--------|
| | |
| Main Artificial Insemination Centers | 192 |
| Artificial Sub-Insemination Centers | 787 |
| Semen Production Units | 4 |
| Senior Veterinary Officers (A.H.) + (B.I.) | 29 + 5 |
| Veterinary Officers (Extension Wing) | 2090 |
| Veterinary Officers (Research Wing) | 107 |
| Veterinary Assistant (A.H +B.I) | 3046 |
| A.I. Technician + A.I. Supervisors | 1642 |
| Research Institutes | 6 |
| Diagnostic Laboratories | 36 |
| Government Poultry Farms | 10 |
| Commercial Poultry Farms | 23927 |
| Hatcheries | 123 |
| Feed Mills (Livestock Govt. Sector) | 4 |
| Feed Mills (Poultry Pvt. Sector) | 119 |
| Feed Mills (livestock Pvt. Sector) | 161 |

Table 3: Livestock Production⁹

| Species | Pakistan no's) | (Million | Punjab (Share %) |
|-----------|-------------------|----------|------------------|
| Buffaloes | 32.7 | | 65 |
| Cattle | 36.9 | | 49 |
| Goats | 63.1 | | 37 |
| Sheep | 28.4 | | 24 |
| Poultry | 721.0 | | 45 |
| | | | |

Table 4: Production of Livestock Products¹⁰

| Products | Pakistan | Punjab (Share %) |
|-------------------------|----------|------------------|
| Milk (000 tons) | 47,951 | 62 |
| Beef (000 tons) | 1,769 | 43 |
| Mutton (000 tons) | 629 | 32 |
| Poultry Meat (000 tons) | 834 | 65 |
| Eggs (Million no's) | 13,144 | 50 |

1.2 Livestock Profile: Balochistan and Sindh

Balochistan, the largest province of Pakistan in terms of area, has a variety of geographic features including mountains, rangelands, deserts and forests. As for the province's economy as a whole, livestock plays an important role for the inhabitants of Balochistan in terms of income and employment.

For most of the poor and landless farmers, it enables them to earn income using common property rangelands owned by different tribes.

⁹ Economic Survey of Pakistan, 2011-12
Pakistan Livestock Census, 2006

¹⁰ Economic Survey of Pakistan, 2011-12

Table 5: Livestock Situation in Balochistan¹¹

| Species | Cattle | Buffalo | Sheep | Goats | Camels |
|-------------------------|--------|---------|-------|-------|--------|
| Population (percentage) | 8 | 1 | 48 | 22 | 41 |

Sindh, on the other hand, is the second largest province of Pakistan on the basis of population. It is believed that there is great potential in the livestock sector of Sindh, which if properly managed, can certainly help uplift the socio-economic conditions of rural Sindh. Sindh, with a total of 15 million cattle and buffaloes, has less than half the number of Punjab's cattle and buffalo population, but also has only an average per year milk yield of 0.85 tons per animal compared to Punjab's 1.46 tons per animal. Sindh has a greater incidence of poverty than Punjab, with 47% of the rural population compared to 39% in Punjab below the poverty line, and there are significantly more landless with 59% in Sindh compared to 45% in Punjab.¹² With poverty increasing, various studies indicate that poor livestock farmers mainly supply animals to informal processing or home consumption use.

Table 6: Livestock Population in Sindh¹³

| Species | Cattle | Buffalo | Sheep | Goats | Camels |
|-------------------------|--------|---------|-------|-------|--------|
| Population (percentage) | 23 | 27 | 15 | 23 | 30 |

It is worth noting that these statistics show different provinces having strength in different species of livestock. Also, the concentration of livestock across different areas in any province is not uniform.

¹¹ Pakistan Livestock Census, 2006

¹² Provincial Livestock Policy Framework, USAID Report 2011

¹³ Pakistan Livestock Census, 2006

1.3 DAIRY SECTOR

1.3.1 Milk's Contribution to the Livestock Sector – Supply Side

The dairy sector in Pakistan plays a significant role in the national economy and its value is more than that of the wheat and cotton sectors combined. Estimated annual milk production in 2011 was approximately 46.4 million tons, making Pakistan one of the five largest milk producing countries of the world. Some 95 percent of all milk is produced from small-scale rural and peri-urban holdings with two to three milking animals.

Milk production and marketing in Pakistan is exclusively dominated by the informal private sector, consisting of various agents, each performing a specialized role at the relative node in the supply chain. These consist of producers, collectors, middlemen, processors, traders, and consumers. Only 3-5% of total production in the country is marketed through formal channels. The remaining 95% is produced and marketed in raw form by informal agents in the marketing chain. Dairy productivity is only 22% of world benchmarks, as 30-40% animals are estimated to be underfed, and 90% unprotected from disease.¹⁴

Informal Production & Marketing Channel Subsistent farmers constitute the majority of dairy farmers in the country and are responsible for approximately 95% of the milk produced. They keep 1-5 milk producing animals on the farm¹⁵.

Productivity Due to the lack of proper management practices and poor breeding, animal production tends to be very low. This results in low farm profitability and reduced national productivity.

Unorganized Farmers Small dairy holders in Pakistan are unorganized and they mostly carry out production and marketing in isolation from each other. This particularly hampers farm profitability in a situation where production base is highly fragmented. This can be contrasted with collective marketing, which could surely enable individual farmers to reach farther markets and result in increased revenue.

The livestock production figures of Pakistan highlight the hefty weightage of milk contribution towards the total livestock sector.

Table 7: Year wise Livestock Products Production of Pakistan (in 000 tons)¹⁶

| Product | 2009 | 2010 | 2011 |
|---------|--------|--------|--------|
| Milk | 43,562 | 44,978 | 46,440 |
| Mutton | 590 | 603 | 616 |
| Beef | 1,601 | 1,655 | 1,711 |

An analysis of the growth trends of livestock products production shows that there has been a subsequent increase over the years. However, the extra volumes are a result of increased herd size, and cannot be attributed to enhanced animal productivity, which has remained

¹⁴ Provincial Livestock Policy Framework, USAID Report 2011

¹⁵ Umm E. Zia, Pakistan: A Dairy Sector at a Crossroads, 2007

¹⁶ Economic Survey of Pakistan (various issues)

constant. According to the Government of Pakistan, the average annual yields of cows and buffaloes have remained approximately 453 and 904 kg respectively. Pakistan faces post-production losses of milk at 15%, causing an annual loss of around Rs 169 billion. The lack of infrastructure, such as cooling facilities at farms, collection points, or milk transportation, has been identified as the prime cause. With an overall contribution of PKR 540 billion to the national economy (with 97% as informal non-documented economic activity) there is potential for a growth level of 20% in this sector¹⁷ through recovery of post production losses and by tapping informal farmers. Since the industry is almost entirely based on informal channels, large portions are still not structurally connected to the formal market mechanism i.e. most milk is distributed through a multi-layered system of middle men. As the formal sector expands it will incorporate more of these fragmented small holding farmers into the formal economy.

1.3.2 Milk Usage – Demand Side

Milk and milk equivalents have the second highest level of per capita consumption in Pakistan. The annual per capita consumption of milk at national level is 190 liters. Province wise per capita consumption is as follows¹⁸:

Table 8: Province Wise per Capita Milk Consumption

| Province | Per Capita Consumption |
|-------------|------------------------|
| Sindh | 246 kg |
| Punjab | 132 Kg |
| KP | 86 Kg |
| Balochistan | 108 Kg |

The demand for fresh milk and dairy products in Pakistan will definitely continue to increase over the years, the fact behind the phenomenon being the growth of the human population. Other variables influencing increasing demand of milk are the growth of personal incomes. For the last few years, the sector has registered a constant growth of around five per cent, which has led some to believe that the country may well be in a position to exploit the changing global export market scenario. Pakistan should make the best of this changed environment where prices of milk products in the world are expected to rise due to the reduction or even elimination of subsidies to the agriculture sector by the West.

Some industry experts, however, insist that the five per cent growth in the national dairy sector is offset by a demand which is growing by 15 per cent. The demand-supply gap, according to them, is going to increase to 3.6 billion liters by 2015¹⁹. The primacy of the

¹⁷ Annual Plan, 2012-13

¹⁸ Sindh Board of Investment: Pre-feasibility Study on Dairy Farm in Sindh, 2010

¹⁹ Tetra Pak Dairy Hub Initiative: A Community Dairy Development Programme

<http://www.tbl.com.pk/tetra-pak-dairy-hub-initiative-a-community-dairy-development-programme/>
Humair Ishtiaq, Rising Milk Supply and Demand Gap; Dawn Newspaper Archives

target, as such, they argue, should be to meet the local demand first. Regardless of the debate regarding what actually represents a realistic target, the fact remains that in either case, the country needs to have an integrated approach that may start from improving productivity per animal right up to milk procurement procedures and cut down wastage. For the past several years, milk has been imported to bridge this supply gap.

1.3.3 Yield of Milk Comparison:

In terms of yield, a comparison between Pakistan and the United States is an effective marker. Pakistan has around five million milk animals while the US has only 3.4 million. But the US produces 94.5 billion liters milk annually, while Pakistan produces around 35 billion. We have 1.6 million more animals, but produce 60 billion liters less milk. Per animal yield of milk in the US is 28.35 liters, while in Pakistan it is 3.15 liters per milking animal.²⁰

1.4 Meat Sector

Meat is the second largest commodity after milk. The size of the meat market in Pakistan is approximately 2,185,000 metric tons. Estimates suggest that the meat demand is growing at almost 6% per annum while supply is growing at 1.8%; leaving a demand gap of 4.2%.²¹ This gap is likely to grow in prevailing circumstances given the pressure of population growth. Additionally, the meat sector in Pakistan has enormous export potential. Moreover, the world meat market continues to grow, with countries such as Saudi Arabia and Malaysia continuing to import increasing amounts of meat. The meat sector in Pakistan has considerable export potential which may be taken full advantage of provided concrete measures are taken to find and penetrate new export markets with quality assured products. Geographically, Pakistan occupies an important place in the area and has significant advantage with respect to a vast, untapped market in its neighbors, where Pakistani meat enjoys a competitive advantage.

Currently, about 12 meat processing plants are working in the major cities of the country. There are about 180 slaughterhouses in operation throughout Punjab under local governments which account for 60% of licit slaughtering²². The remaining 40% accounts for illegal and unregistered activity. There is only one state of the art poultry meat processing plant in the city of Raiwind near Lahore, Punjab. Recently, a state-of-the-art slaughterhouse had been set up at Shahpur Kanjran for providing fresh and hygienic meat to the people of the provincial metropolis. The facility is expected to accommodate the slaughter of 35 lakh animals and, besides fulfilling the local needs, it is expected to make possible the export of certified Halal meat of international standard to Malaysia, Middle East, Europe and other countries²³. Apart from this, only 8-10 privately owned slaughter houses are available which are again focusing on slaughtering under semi-mechanized conditions for the export of meat²⁴.

<http://archives.dawn.com/archives/25715>

²⁰ The White Revolution: Dhooth Darya, Pakistan Dairy Development Company, 2006
Umm E. Zia, Pakistan: A Dairy Sector at a Crossroads, 2007

²¹ Economic Survey of Pakistan, 2011-12

²² Punjab Livestock sector Profile, PBIT

²³ The News Archives

<http://www.thenews.com.pk/Todays-News-5-104132-CM-sees-foreign-exchange-through-meat-export>

²⁴ Punjab Livestock Sector Profile, PBIT

1.5 DISTORTIONS AND INEFFICIENCIES IN THE LIVESTOCK SECTOR

Much evidence exists as to the significant importance of the livestock sector for the economy. However, livestock industry potential is constrained by distortions and imbalances created due to the flawed planning and management of resources, deficient and inconsistent policies, insufficient infrastructure facilities, limitation of competition, continued governmental desire to control market operations, narrow scope of budgetary allocations with the main focus on only 3 areas, maintenance of livestock farms, breeding operations and curative treatment, lack of regulation on the conduct of livestock markets, lack of incentives for private sector involvement and crippled opportunities for the private sector to provide alternative market services.

1.6 REDRESSING INEFFICIENCIES THROUGH POLICY REFORMS

With clear evidence as to the economic and social importance of the livestock sector in Pakistan, it goes without saying that livestock is likely to emerge as an engine for economic growth in the country. However, the past approach of livestock services that encompasses research, extension, credit and veterinary programs delivered in piecemeal is no longer adequate to meet the changing needs and upcoming challenges of the sector. The livestock sector is recognized as a potential sector for export earnings offering great economic opportunities which, however, remain largely untapped. At the same time increased competition, resource constraints, disease threats and new trade standards are putting great pressure on the livestock sector. The need to increase per animal productivity, manage sectoral complexity, combat disease and ensure compliance with food security and safety obligations has forced the livestock sector to change and adapt to these new challenges.

Consequently, it becomes imperative for provincial governments to develop the livestock sector to meet upcoming challenges, utilize its untapped potential and put the sector on the right track for increasing the income of farmers supported by a conducive policy and regulatory environment and attracting private investment for expanding livestock business. The Provincial Livestock Policy Framework developed by the USAID Pakistan Firms Project is one milestone attempt which envisages countering the inefficient and distortive practices in the livestock sector in order to support its growth. Policy reforms have been proposed in the following areas:

- Disease surveillance and control
- Disease Treatment
- Vaccine production
- Feed production and monitoring
- Extension services
- Breed improvement
- Research and development

- Livestock Marketing
- Meat processing and marketing
- Commercial livestock production
- Animal welfare
- Environment
- Rangeland management

In order to calculate the economic benefits of provincial policy reforms, an input-out impact calculation framework has been developed. The model based on input-output analysis provides quantitative information by linking inputs (policy reforms) and the corresponding probable outputs (impact indicators) on the basis of certain assumptions. The economic benefits of the proposed policy reforms have been calculated on the basis of the following impact indicators:

1. Livestock Income:
This impact indicator covers the income related aspects of people engaged in livestock activity.
2. Productivity:
This impact indicator relates to production of livestock, its products and their productivity (defined in economics term as the amount of output produced per unit of input utilized).
3. Profitability
This impact indicator targets the cost and benefit/ revenue and expenditure areas of livestock sector.
4. Tradable Volume
This indicator revolves around exports and imports of livestock and its products.

Some quantifiable economic variables have been made use of in order to facilitate the calculations with regard to the aforementioned impact indicators. Also, since the proposed policy reforms are not mutually exclusive, they have been clubbed together in order to make the necessary calculations.

2.0 STUDY METHODOLOGY AND ANALYSIS

2.1 Calculating Economic Benefits of Policy Reforms

The following table gives probable annual economic benefits accruing out of the proposed policy reforms. For the purpose of calculations, some assumptions (detailed in following section) have been made and conservative estimates have been calculated.

Table 9: Input- Output Impact Calculation Model

| Serial no. | Input (Area of Policy Reform) | Primary Agent of Action | Output (Impact Indicator) | Theoretical Outcome (Variables for Analysis) | Projections & Economic Benefits ²⁵ |
|------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <ul style="list-style-type: none"> Disease surveillance & control | Public Sector | Livestock Income & Productivity | <ul style="list-style-type: none"> Per capita Income from livestock Livestock population | <ul style="list-style-type: none"> \$614.65 (\$65.85/person) 970.31 million no's (88.21 million no's) |
| 2 | <ul style="list-style-type: none"> Breed Improvement Research and Development Extension Services | Public & Private Sector | Productivity & Profitability | <ul style="list-style-type: none"> Production (meat & milk) Average annual yield of milk(per milking animal) Expenditure Saving (on extension schemes by L&DD, Punjab) | <ul style="list-style-type: none"> Meat: 50,027.28 thousand tons (2076.28 thousand tons) Milk: 3422.69 thousand tons (190.69 thousand tons) Yield of milk: 4 liters (0.85 liter) Exp Saving: Rs. 803,050 |
| | <ul style="list-style-type: none"> Livestock | | | <ul style="list-style-type: none"> Revenue (from | <ul style="list-style-type: none"> Rs. 2.1 billion/ \$ 22.5 million |

²⁵ The last column gives projected (forecasted) values of livestock industry specific economic variables. The values in parenthesis give annual economic benefit.

| | | | | | |
|---|------------------------------------------------|-------------------------|--------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Marketing • Infrastructure development | Public & Private Sector | Profitability & Productivity | market auction rights in Punjab • Post Production losses(milk) | (Rs. 0.1 billion/ \$ 1 million) • Recovery of milk post production losses: (\$ 1.8 billion) |
| 4 | Meat Processing, value addition and marketing. | Public & Private Sector | Tradable Volume & productivity | • Exports • Per capita availability of meat & milk • Slaughtering activity (Punjab) | • \$ 171.76 million (\$30.16 million) • Meat: 22.36 kg (0.86 Kg) • Milk: 170.27 liters (0.27 liters) • Animals slaughtered: 129964 hundred no's (6189 hundred no's/yr) |

2.2 METHODOLOGY

The key steps undertaken in order to forecast annual economic benefits from policy reforms include:

1. To keep a realistic approach and in order to arrive at conservative estimates (as given in the above table), past trends of livestock specific economic variables have been utilized. After calculating the percentage change in years 2010-2011/2011-2012, criterion for calculating minimum achievable gain has been applied. This criterion is as follows;

Min Achievable Benefit/Gain: value of output derived by assuming that there is an “incremental” (additional) contribution proportional to one-third of the percentage change calculated for each economic variable.

2. The minimum achievable gain criterion itself has been based on the premise that any policy reform is bound to have an impact over and above the past trend.
3. The minimum achievable gain captures a conservative estimate (least possible value) of impact of policy reforms in the economy.
4. Aggregates of economic data (i.e. for the whole economy) have been used to calculate the economic benefits of proposed policy reforms. In some cases however, calculations have been made specifically using Punjab specific data.

5. The provincial policy framework proposed specifically for Punjab by the USAID Firms Project has been made the basis of the economic model thus developed.
6. The value of post-production losses of milk gives maximum recovery value given reform is implemented.
7. Projections for increased livestock population have been made for five important heads; buffalo, cattle, goats, sheep and poultry.
8. All economic benefits are annual.
9. For revenue gain from market auction rights in Punjab, it is assumed that private sector involvement and increased number of cattle markets will increase local government revenues by at least 5% of value (assessed in the USAID report on Livestock Rapid Market Appraisal, 2011)
10. For the calculation of per capita income from livestock, calculation is based on the premise that 75% of the population is engaged in livestock and draws 40% of its income from it.
11. For the calculation of budgeted expenditure saving of L & DD Dept Punjab on schemes (extension), it is assumed that there is a consequent 5% reduction in expenditures due to private agents rendering extension services.
12. Calculations in this document are based on figures/information obtained from various editions of Economic Survey of Pakistan (GoP, Finance Division) and USAID Livestock Rapid Market Appraisal Study, 2011.
13. Variables taken for calculation of benefits have been chosen on the basis of knowledge of important theoretical linkages between various elements of economic activity. Thus these variables account for "probable" economic outcomes of policy reforms.

It must be noted that this document provides a snapshot of probable potential future benefits from policy reforms. It is based on limited data availability due to dearth of compilation of economic data by government departments and concerned authorities. Also, the study does not take political or security factors into account i.e. for the purpose of analysis these variables have been kept constant.

2.2.1 Economic Benefits from Disease Surveillance and Control:

Policy Reforms in the area of disease surveillance and control indicate increased government capacity to conduct disease surveillance programs. This would enable the detection of new exotic diseases and will counter animal death and disease losses. As a result, incomes of households involved in livestock activity are bound to increase. Furthermore, livestock population numbers would increase as a response to the curtailment of the spread of various diseases. Such infectious diseases control through vaccination is also an element of the productivity enhancement of animals. The following tables give the necessary calculations associated with the derivation of economic benefits. The minimum achievable benefit criterion has been applied to arrive at estimates. According to this criterion, it is assumed that the minimum achievable benefit is equal to an incremental increase in the value of a particular variable proportional to one-third of the percentage change derived from its past trend.

Calculating Benefit through Increased Per capita Income from Livestock

| | |
|----------------------------------------------------------------------------------------------------------------------------|------------------|
| Per capita income (US \$) FY 12 | \$1372 |
| Per capita income (US \$) FY 11 | \$1258 |
| Total Population (in million) FY 12 | 178.91 |
| Total Population (in million) FY 11 | 177.1 |
| Since 75% of the population is engaged in livestock (LS) and draws 40% of its income from it; | |
| Per capita income(Y) from LS (for 135 million people) in FY 12 | \$548.8 |
| Per capita income(Y) from LS (for 133 million people) in FY 11 | \$503.2 |
| Percentage Change (% Δ) = $\frac{\$548.8 - \$503.2}{\$503.2} \times 100$ | |
| = 9 % | |
| <i>Min Achievable Benefit= an incremental increase in per capita Y from LS proportional to 1/3rd of the % Δ</i> | |
| Gross Incremental change (following the reform) = [9% + 1/3 rd (9%)] | |
| = [9 + 3] | |
| = 12% | |
| Forecasted per capita income from LS | = 12% of \$548.8 |
| | = \$ 614.65 |
| Economic Benefit (in terms of incremental income) = \$ 65.85 per person. | |

Since 75% (135 million in FY12) of the population is involved in LS in one way or the other and draws 40% of its income from it, based on percentage change calculation and applying the minimum achievable gain criteria, a value of US \$ 614.65 comes out following the imposition of reforms. This value indicates an increment in income of livestock holders by \$ 65.85.

Calculating Benefit through Increased Livestock Population

| | |
|----------------------------------------------------|-------|
| Total livestock population (million no's) in FY 12 | 882.1 |
| Total livestock population (million no's) in FY 11 | 819.9 |
| %Δ = $\frac{882.1 - 819.9}{819.9} \times 100$ | |
| = 7.5 % | |

Min Achievable Benefit = incremental increase in population proportional to 1/3rd of the % Δ

$$\begin{aligned} \text{Gross incremental percentage change (following the reform)} &= [7.5\% + 1/3^{\text{rd}} (7.5\%)] \\ &= 10\% \end{aligned}$$

Forecasted total livestock population = 10% of 882.1

$$= 970.31 \text{ (million no's)}$$

Economic Benefit (in terms of incremental LS population) = 88.21 (million no's)

The calculations for economic benefit associated with increased livestock population have been done for five important animal heads; buffalo, cattle, goats, sheep and poultry. (See appendix)

An analysis of past trend shows a 7.5% increase in LS population in FY 11 / FY 12. By applying the minimum achievable gain criteria a projected value of 970.31 (million no's) has been derived. This implies an economic benefit (in terms of incremental LS population) of 88.21 (million no's).

2.2.2 Economic Benefits from Breed Improvement, R&D and Extension Services

Proposed policy reforms in the area of extension services, breed improvement and R&D intend to act as stimulus to the growth of this sector. Better and wide coverage of extension services, better breeds of animals coupled with new and innovative production techniques enhance the productivity of the sector. Thus, the resultant impact of policy reforms in this specific area has been captured through increased production (meat and milk), recovery of post-production losses of milk (owing to better infrastructure and cooling facilities for milk) and increased average yield of milk.

Table 10: Calculating Benefit through Increased Production (Milk & Meat)

| Gross Production (000 tons) | FY 11 | FY 12 | % Δ |
|-----------------------------|--------|--------|-------|
| Milk | 46,440 | 47,951 | 3.25% |
| Meat | 3095 | 3232 | 4.4% |

Min Achievable Benefit = incremental contribution to production proportional to 1/3rd of % Δ

$$\begin{aligned} \text{Gross incremental \% } \Delta \text{ for milk} &= [3.25\% + 1/3^{\text{rd}} (3.25\%)] \\ &= [3.25 + 1.08] \\ &= 4.33\% \end{aligned}$$

Forecasted milk production = 4.33% of 47,951

| |
|--------------------------------------------------------------------------------|
| = 50,027.28 (000 tons) |
| Economic Benefit (in terms of incremental milk production)= 2076.28 (000 tons) |
| Gross incremental % Δ for meat = [4.4% + 1/3 rd (4.4%)] |
| = [4.4 + 1.5] |
| = 5.9% |
| Forecasted meat production = 5.9% of 3232 |
| = 3422.69 (000 tons) |
| Economic Benefit (in terms of incremental meat production)= 190.69 (000 tons) |

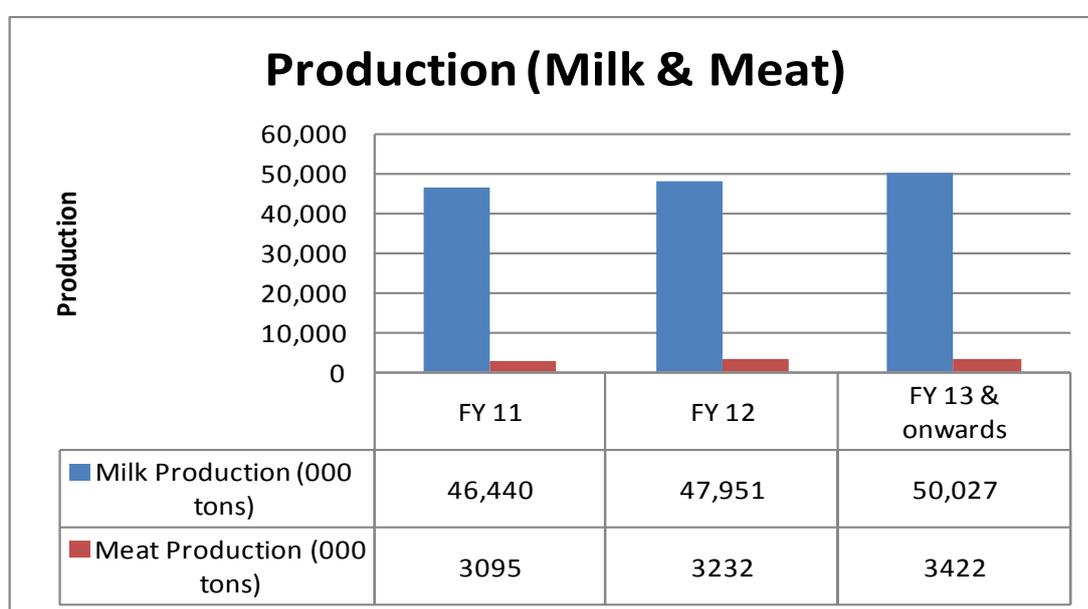


Figure 1: Productions of Milk and Meat

The figure above depicts increased production for both milk and meat given the adoption of proposed policy reforms.

The post production losses of milk in Pakistan amount to 15% causing annual loss of around US \$1.8 billion. The lack of infrastructure such as cooling facilities at farm or collection points as well as transportation of milk has been identified as the prime cause. A recovery of maximum loss value of US \$1.8 billion can be made if reforms are undertaken. Any other value below US \$1.8 billion would also represent the associated economic benefit.

The budget forecasted amount for 2012-2013 for provincial schemes (extension) as expressed in the medium- term budgetary framework (2010-13) by the Livestock and Dairy Development Department, Punjab is Rs. 16,061,000. With the effect of proposed policy reforms suggesting private extension providers develop capacity and provide facilitation to livestock farmers, the department can save at least 5% of the forecasted amount (i. e. Rs. 803,050) and can divert it towards other schemes to fulfill other policy objectives of the department. This expenditure saving represents an economic benefit to the economy.

2.2.3 Economic Benefits from Livestock Marketing and Infrastructure Development

Marketing and distribution in Pakistan involves many stakeholders; producers, dealers (usually from villages or adjoining areas), wholesalers, butchers, and consumers. It is difficult to be precise about their exact numbers and their role in the marketing process. The marketing takes place on individual animal as well as on lot basis. A lack of transportation, communication and information systems result in seasonal and spatial price fluctuations. The existence of a limited number of markets and the absence of any pricing system linked to weight and quality are the major disadvantages in the current marketing system. No record of any type regarding the number of animals arrived, animals traded and value of trade is maintained in the market. Although receipts for entry/transaction charges are issued, these do not cover all the aspects and the information so obtained is not compiled at any level. This lack of compilation of data acts as a hindrance to economic analysis specifically focused on these cattle markets.

The livestock marketing reforms call for increased participation of the private sector and registered businesses to conduct livestock markets and ensure competition. Furthermore, commercial entities are to invest in land and infrastructure and conduct markets according to the rules of market conduct. Livestock markets in Punjab are mostly owned and contracted out by the local governments. A handsome contractual amount is received in this way which is mostly not invested back in the markets. An increase in the number of cattle markets and enhanced participation of private sector would ensure greater revenue to local governments in the form of market auction collection rights. As per the USAID report, Livestock Market Rapid Appraisal 2011, revenue collection from livestock markets in Punjab (only 144 markets as studied for analysis) as per budgetary allocation in 2010-2011 was Rs. 2042203970 (Rs. 2 billion / \$ 21.5 million). The entry of private players through proposed reforms is bound to increase revenues to the local government. Assuming that there is a consequent 5% increase to the local government, the revenue slab for the government can increase to a minimum of Rs. 2.1 Billion/ \$22.5 million. This implies incremental revenue of Rs.0.1 billion / \$ 1 million to the local government.

As per government estimates, the average annual yield of milking animals in Pakistan is 3.15 liters. Assuming that there is a minimum increase in productivity by 10%, the average annual yield per milking animal becomes 4 liters. This means an economic gain of 0.85 liters per milking animal.

2.2.4 Economic Benefits from Meat Processing and Marketing

The major potential exports include animal casings, bone and its products, animal waste, live animals, meat, dry milk, wool, hair, feed for animals and poultry. The export of livestock and its products is constrained because of the presence of contagious diseases, and poor sanitary/hygiene conditions of our slaughterhouses and slaughtering practices and processing units for value addition. Furthermore, there has been less emphasis on value addition over the years. Reforms proposed in this area suggest private sector freedom to undertake the slaughter of livestock and processing activities to produce meat products for domestic and export use. This would in turn cause an effect on the per capita availability of food items (meat and milk) and the potential tradable volume.

Table 11: Calculating Benefit through Increased Exports

| Exports (\$ millions) | FY 11 | FY 12 | % Δ |
|-----------------------|-------|-------|-----|
| | | | |

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----|
| Meat & meat preparation | 122.0 | 141.6 | 16% |
| <p><i>Min Achievable Benefit= incremental contribution to exports proportional to 1/3rd of % Δ</i></p> <p>Gross incremental % Δ = [16% + 1/3rd (16%)]</p> <p style="padding-left: 40px;">= [16 + 5.3]</p> <p style="padding-left: 40px;">= 21.3%</p> <p>Forecasted exports = 21.3 % of 141.6</p> <p style="padding-left: 40px;">= \$171.76 million</p> <p>Economic Benefit (in terms of incremental exports)= \$ 30.16 million</p> | | | |

The potential volume of exports has been forecasted as \$ 171.76 million. This gives a value of \$30.16 million as the economic benefit associated with incremental exports following the imposition of reforms, also depicted in the figure.

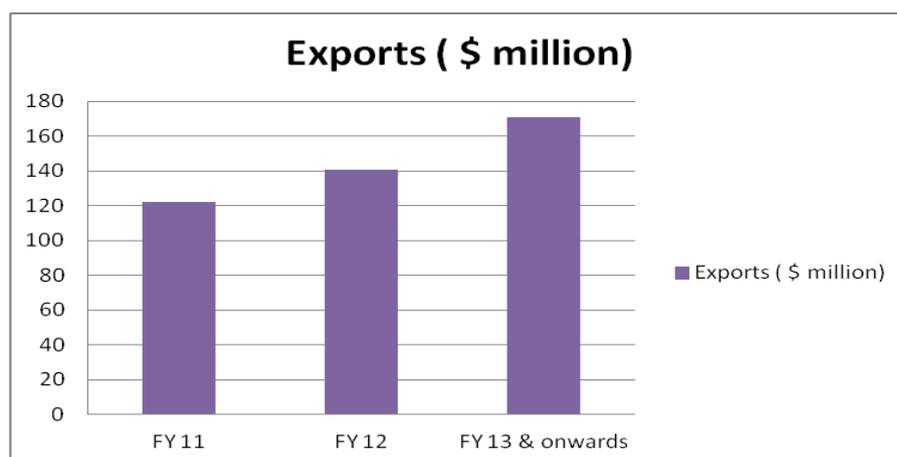


Figure 2: Exports (Meat & Meat Preparation)

Table 12: Calculating Benefit through Increased Per Capita Availability (Meat and Milk)

| Per Capita Availability | FY 11 | FY 12 | % Δ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|
| Meat (kg) | 20.9 | 21.5 | 3% |
| Milk (ltr) | 169.8 | 170.0 | 0.12% |
| <p><i>Min Achievable Benefit= incremental contribution to per capita availability of food proportional to 1/3rd of % Δ</i></p> <p>Gross incremental % Δ for meat= [3% + 1/3rd (3%)]</p> | | | |

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $= [3 + 1]$ $= 4\%$ <p>Forecasted per capita availability of meat = 4% of 21.5</p> $= 22.36 \text{ kg}$ <p>Economic Benefit (in terms of incremental per capita availability)= 0.86 kg</p> <p>Gross incremental % Δ for milk= [0.12% + 1/3rd (0.12%)]</p> $= [0.12 + 0.04]$ $= 0.16 \%$ <p>Forecasted per capita availability of milk = 0.16 % of 170.0</p> $= 170.27 \text{ liters}$ <p>Economic Benefit (in terms of incremental per capita availability)= 0.27 liters</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Projections thus calculated for per capita availability of meat and milk imply an economic benefit of 0.86kg per person associated with meat availability and an economic gain of 0.27 liters of milk per person.

According to the Punjab Development Statistics 2011, the livestock sector has witnessed a declining trend in slaughtering activity by both recognized and unrecognized slaughter houses in Punjab. This calls for increased emphasis on the need for the private sector to take over and combat the declining trend and ensure sufficient food availability to the growing population of the country.

Table 9.6 Calculating Economic Benefit through Increased Slaughtering by Private Sector

| |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Total no. of animals²⁶ slaughtered</p> <p>(Recognized & unrecognized slaughter houses) in FY 09 = 123935 (hundred no's)</p> <p>Total no. of animals slaughtered in FY 10 = 123775 (hundred no's)</p> <p>% Δ = - 0.12%</p> <p>Assuming that as a consequence of private sector involvement and freedom in undertaking the slaughter of animals in the form of privately owned slaughter houses, this declining trend is offset with an incremental 5% slaughtering activity, the total number of animals slaughtered can increase to 129964 (hundred no's) implying an economic benefit of 6189 (thousand no's) animals slaughtered per year (in Punjab).</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2.2.5 Overall Impact on Gross Domestic Product (GDP)

As a consequence of all the proposed policy reforms, the overall impact on GDP can be calculated in terms of the change in the contribution of livestock to GDP. It is noted that in

²⁶ Animals included ; cattle, buffalo, sheep , goats and others

the absence of any such reforms, livestock has been contributing about 10.6% - 11.6% to GDP in the last ten years (FY 03 - FY 12). This implies that for these ten years, its contribution has remained stagnant within this bracket (10.6% -11.6%) with a maximum of 9.4% overall change. In light of the premise that reforms are bound to have an impact over and above the past trend and considering conservative estimation, it is assumed that the livestock sector can be expected to have minimum incremental contribution of 5% from the current value of 11.6 percent. This means that the contribution of the livestock sector to GDP can increase to 16.6% in the following years subject to the implementation of reforms.

The following figure shows the contribution of the livestock sector to the GDP for the past ten years and future projection (subject to implementation of policy reforms)

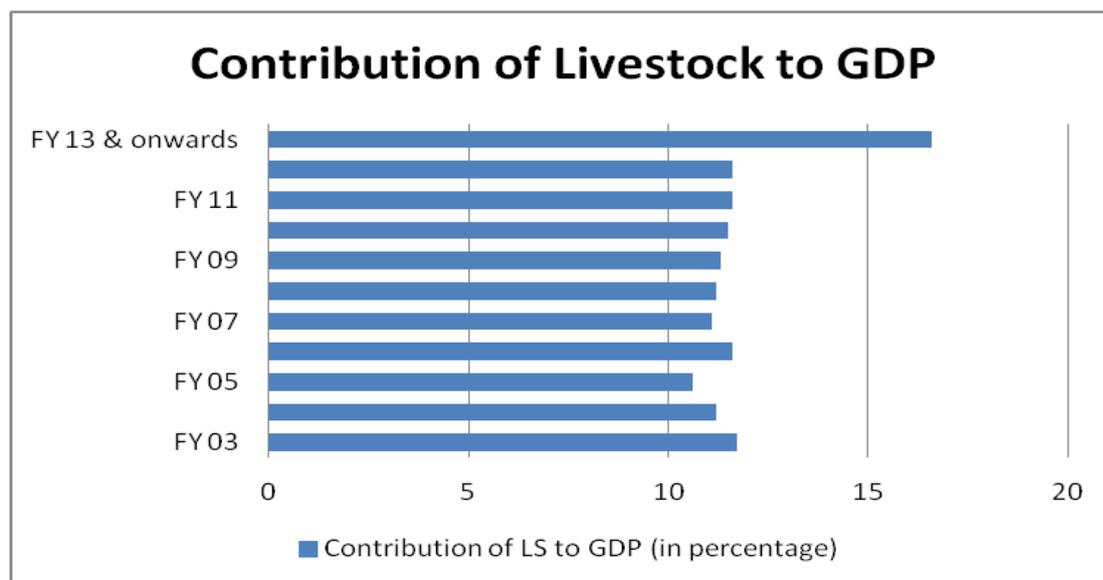


Figure 3: Livestock Contribution to GDP

3.0 CONCLUSION

The livestock sector has faced not only neglect and a lack of interest, but also an outright bias from our national and provincial policy makers and politicians. This situation is reflected in the limited number of programs or projects promoting livestock development.

The challenge that lies ahead is reversing this situation. This requires very clearly defined policy reforms and a subsequent comprehensive strategy to strengthen small-scale livestock farmers, household livestock production systems and livestock marketing facilities, all of which undoubtedly bring economic and social improvement at the family, village, provincial and national levels. In such a situation, it becomes imperative for the government to dedicate specific space and commitment to the implementation of policy reforms in the sector. In the context of the proposed policy reforms, an analysis of the forecasts and economic benefits calculations lend credence to the idea that such policy reforms, as “statements of good intentions”, can in fact help in the enrichment and development of the sector by having a favorable impact on the target groups.

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