Chapter-6
Finding, Suggestion, Recommendation and Conclusion

Objective 1. To study existing level of market in carbon trading for sugar industries in Western Maharashtra.

6.1 Findings & Discussion

1. Maharashtra Sugar Industry is a standout amongst the most eminent and vast scale sugar producing areas in the nation. The pace of development of sugar fabricating has been gigantic in the course of recent years. The most recent insights of sugar creation in Maharashtra show that these express this improving the situation than alternate states in the nation. The Sugar business in Maharashtra is profoundly mainstream in the cooperative division, as ranchers claim a part in the sugar industrial facilities. The Maharashtra Sugar Industry has seen a dynamite development inferable from the diverse helpful in the state. One of the central harvests made in Maharashtra is sugarcane, with a large group of sugar ventures been set up finished the years.

(Source: Maharashtra State Co-operative Sugar Factories Federation Ltd, 2012)

2. By 1970, the sugar cooperatives in Western Maharashtra, accepted political significance, there being 37 of them in the South and Central Zones and in the late 1970s, and from that point, the 'sugar campaign' in Western Maharashtra ended up noticeably sufficiently powerful to assign the Chief Minister of the State. In perspective of the experience of the fruitful sugar cooperatives, co-administrator pioneers from different parts of the State, especially from the Marathwada and Vidarbha locales, began requesting consent to set up a sugar cooperative in different regions in the less created regions.

Western Maharashtra is the pioneer in sugar manufacturing it was observed that more number of sugar factories can found in Western Maharashtra only.

(Source: http://www.mahasugarfed.org/)

3. Carbon is now tracked and traded like any other commodity. This is known as the "carbon market."— adopted in Kyoto, Japan, on 11 December 1997. The first commitment period started in 2008 and ended in 2012 and second commitment

194 http://unfccc.int/kyoto_protocol/items/3145.php
period from January 2013 to December 2020. Parties with commitments under the Kyoto Protocol (Annex B Parties) have accepted targets for limiting or reducing emissions. The goal is to lower overall emissions from six greenhouse gases - carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, HFCs, and PFCs - calculated as an average over the five-year period of 2008-12. National targets range from 8% reductions for the European Union and some others to 7% for the US, 6% for Japan, 0% for Russia, and permitted increases of 8% for Australia and 10% for Iceland.1

4. India committed to reduce the intensity of its carbon emissions by 20 to 25 percent by 2030 from 2005 levels195, meeting a deadline for developing countries to set voluntary carbon-curbing actions.

5. The Shri Pandurang Sahakari Sakhar Karkhana (SSK)196 from Solapur has earned carbon credits (certified emission reduction - CER) worth 14 crore in 2006 This is the second time, it has earned carbon credits. It is indicating that one cooperative sugar industry can earn 14 Crore through dealing in carbon trading by reducing GHG gases bagasse-based cogeneration as per the Kyoto protocol197, if the rest of cooperative sugar industries i.e 69 start dealing in carbon trading definitely the total earning will go around 1280 Crore including 70 sugar industries198.

6. By 2017, there is a total exportable power potential of approximately 9700 MW. This can fulfill almost 6 per cent of the additional power requirement of 128 GW by 2017199. The sector can also generate 48 million carbon credits through cogeneration, say industry sources. Presently, bagasse-based exportable power is 847 MW, but this could increase to approximately 9700 MW by 2017. The bagasse-based cogeneration is currently less than 0.6 per cent of the installed capacity, but can fulfill 6 per cent of the additional future requirement. There is a significant untapped cogen potential. This can help to partially bridge the energy gap that India faces.

198http://cdm.unfccc.int/Projects/DB/BVQI1142341690.23

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7. The current availability of biomass in India is estimated at about 500 million metric tons per year\(^{200}\). Studies sponsored by the Ministry have estimated surplus biomass availability at about 120 – 150 million metric tons per annum covering agricultural and forestry residues corresponding to a potential of about 18000 MW. This apart, about 700 MW additional powers could be generated through bagasse based cogeneration in the country’s 550 Sugar mills, if these sugar mills were to adopt technically and economically optimal levels of cogeneration for extracting power from the bagasse produced by them.

**Objective 2. To find out challenges and opportunities for adopting modern technology to capture carbon market by Sugar Industries.**

**Findings & Discussion**

1. It is found that only one cooperative sugar industry having excellent knowledge. This clearly showing the necessity of increase in awareness of carbon trading through cooperative sugar industries association. And the effective method of promotion of carbon trading is by visiting the model industry and conducting conferences and seminar. (Ref. Table no.5.2,5.3,5.4)

2. It is observed that only 1 sugar industry has registered for carbon trading i.e. Shree Pandurang Sahakari Sakhar Karkhana, Ltd., and the highest numbers of respondents yet not registered for Clean Development Mechanism (CDM). And Cooperative sugar industries opines that the appropriate Clean Development Mechanism (CDM) mechanism for sugar industry is Renewable Energy i.e. bagasse based cogeneration plant, where this method having high adequacy to gain in carbon market apart from other methods. (Ref. Table no.5.5,5.6,5.9)

3. It is observed that the cooperative sugar industrialist not dealing in carbon trading due to the lack of adequate knowledge. (Ref. Table no.5.11).

4. It is opted that the remedies are available to control the pollution at cooperative sugar industries by carrying ecofriendly activities and preferred eco-friendly activity as waste management and subsequently renewable energy. (Ref. Table no.5.14, 5.15,5.16)

\(^{200}\)http://mnre.gov.in/schemes/grid-connected/biomass-powercogen/
5. It is opted that in sugar industries bagasse is the major kind of allied products. The sugar industrialists are not aware that the eco-friendly activities that mean the remedies to pollution control yield additional profit for them. (Ref. Table no.5.17, 5.18, 5.24)

6. It is found that the industrialists are agreed on the lack of leadership commitment, management is lacking in industrial exposure, board of directors do not have experience about carbon trading, stakeholders highly interested in gaining and distributing the profit. (Ref. Table no.5.24.2, 5.24.7, 5.24.10, 5.24.11)

7. It is found that highest numbers of respondents believed on their employees commitment for undertaking carbon trading project and have an opportunities to upgrade the industry through entry in carbon market which generate additional profit along profit from existed business (Ref. Table no.5.24.6, 5.24.8, 5.25.13)

Objective 3. To find out the solution for bridging the gap between industrialist and government regarding pollution control. (Win-Win-Win approach) Findings & Discussion

1. It is opted that the highest numbers of respondents are ready to deal in carbon trading after resolution of the stated reasons, eliminate the hurdles and desired for government initiation which leads motivation and inclusion of experts from carbon market in advisory board of each industry. (Ref. Table no.5.12, 5.24.9, 5.25, 5.25.25.25.4)

2. The respondents willing for training programme, joint programmes through industries, government, consultancies, visit model companies to update on carbon mechanism that contributes in the corporate social responsibility. (Ref. Table no.5.25.5, 5.25.6, 5.25.7 5.25.9, 5.25.10)

3. It is observed that the highest number of respondents were willing to get supports from financial institutions and professional consultants. (Ref. Table no.5.25.11, 5.25.12)

4. It is opted that the highest number of respondents agreed that entry in carbon market will generate additional profit with profit from existed business and shown interest to implement Clean Development Mechanism (CDM) project if resolved the problems stated in Q21. (Ref. Table no.5.25.13)
Objective 4. To study global contribution to earn foreign currency by carbon trading

Findings & Discussion

1. Paris Agreement has been held in December 2015 total 195 countries signed an agreement to —Hold the increase in the global average temperature to well below 2 degrees i.e. limit the temperature increase to 1.5°C by reducing GHG Emission\(^{201}\). That indirectly insisting to corporate either reduces the pollution or need to pay for excess amount of carbon.

2. Cogeneration is the main vector for obtaining carbon credits in the sugar energy industry. Within the Clean Development Mechanism (CDM), approximately 500,000 tons of CO2 carbon credit equivalents (CERs) are generated per year by Brazilian mills through cogeneration\(^{202}\). This figure is bound to triple if all projects in the validation process are approved. Thus, the sugarcane industry is one of the main industries in Brazil that uses the Clean Development Mechanism (CDM) as a financial tool for investments in low carbon technologies.

3. The Shri Pandurang Sahakari Sakhar Karkhana (SSK) from Solapur has earned carbon credits (certified emission reduction - CER) worth 1.4 crore in 2006. This is the second time; it has earned carbon credit\(^ {203}\). It clearly indicates that if rest industries registering for carbon trading then including 70 cooperative sugar industries from western Maharashtra can gain 1280 crore probably receive carbon credits which also contribute in the economy of India by foreign earnings\(^{204}\).

4. Gangakhed Sugar and Energy Ltd. Santacruz (East), Mumbai started Power plant and the Distillery plant situated at Gangakhed is under the validation process for the registration under Clean Development Mechanism (Clean Development Mechanism (CDM))\(^ {205}\).

5. Maharashtra Sugar Industry is one of the most notable and large-scale sugar manufacturing sectors in the country. The Sugar industry in Maharashtra is highly popular in the cooperative sector, as farmers own a portion in the sugar manufacturing process.

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\(^{204}\) [http://cdm.unfccc.int/Projects/DB/BVQI1142341690.23](http://cdm.unfccc.int/Projects/DB/BVQI1142341690.23)

\(^{205}\) [http://www.gangakhedicpp.com/?link=crbncrdt](http://www.gangakhedicpp.com/?link=crbncrdt)
factories. In the 2001-02 session, 122 co-operatives and 13 private sugar industries in Maharashtra.

One of the chief crops manufactured in Maharashtra is sugarcane, with a host of sugar industries been set up over the years. The pace of growth of sugar manufacturing has been massive over the past few years. The latest statistics of sugar production in Maharashtra indicates that this state this doing better than the other states in the country. The cooperative sugar industry in Maharashtra has seen the growth trajectory at its heights with future trading being implemented in sugar manufacturing. In the season 2001-02 s that 122 cooperative and 13 private industry in Maharashtra.

After thirteen years Maharashtra cooperatives industries decreases and increased the private industries. 96 industries in cooperatives and 61 industries in private stories in 2013-14. It is decreased year by year and increased private sector investment in sugar industry. Crushing of sugarcane decreased in 2003-04 and 2004-05, it was 290.64 and 194.54 lakh metric tonnes respectively, rather than it was found averagely. And sugarcane production decreases in 2003-04 and 2004-05. It was 317.75 and 223.21 Lakh quintile respectively. And it is observed that year by year decreases the average sugar recovery percentage, because the changing the agriculture productivity, pattern and climate of the region.

6. Brazil ranks third among all countries in the number of Clean Development Mechanism (CDM) projects, after China and India. About 50% of these projects are related to the generation of renewable energy, mainly hydroelectric and bioelectricity generating projects based on the incineration of sugarcane bagasse in high efficiency boilers.


6.2 Suggestions and Recommendation:

**Suggestion to Organization:** Different parameters affection on carbon trading was studied. Analysis shown that majority of the sugar industries are not aware about the carbon trading or they are doubt about the entry in the carbon trading market, in this study from all 55 sugar industries study is was observed that the industries having doubt about whether entry in to carbon market will fruitful or not, 25 sugar industries that is 45.46% are very strongly agree that they have doubt about entry in to carbon trading will fruitful or not for their industry, 13 sugar industries that is 23.63% are strongly agree that they are doubt about entry in to carbon trading, 10 sugar industries that is 18.19% were somewhat agree that they have doubt in entry in to carbon trading, 2 sugar industries that is 3.63% were nor disagree that they doubt weather entry will be fruitful or not, 4 sugar industries that is 7.28% were somewhat disagree about entry in to carbon trading will be fruitful or not and only 1 sugar industry very strongly disagree that they were doubt about to entry in to carbon trading will be fruitful or not (Table 5.29.4).

So, till there is opportunities to enter in to carbon trading market because of huge pollution expansions worldwide. Clean Development Mechanism (CDM) Projects has impact on administrative functions due to availability of specialized manpower so companies can have manpower that help them for better performance.

1. Industries may go for to increase the level of awareness about the carbon trading.
2. Maharashtra Industrial Development Corporation may arrange complementary seminar for the industries on current carbon trading program.
3. Maharashtra Sugar Industrial Co-operatives may organize joint programs related to carbon trading.
4. Management and administrative member of the industry can take initiation.
5. Industries can take helps from consultancy.

**Suggestion to the government body:** Indian sugar industries (Western Maharashtra Region) have potential to generate more carbon credit. Central and State Government body of India (NCDMA) has increasingly being creating awareness in the market for the concept. Global market conditions and trade relationship affects the Clean Development Mechanism (CDM) market so economy has to draft such a policy to overcome from the factors. Government has to generate more source of
carbon financing that will help the sugar industries and other industries for better implementation of the Clean Development Mechanism (CDM) Projects.

6.3 Impact of the Research and Managerial Implications:

This study focuses on the extent of pollution and harmful impact on the environment of Maharashtra. It has also been vividly discussed and policy measures outlined to be undertaken by different large and small industries and government to maintain a healthy environment along with the spirit of creating environmental consciousness and awareness about Kyoto agreement and Paris agreement. Benefit of the research is, it will make the awareness between sugar industries about carbon trading at national and international level, also it will help them how to reduce the pollution.
6.4 Conclusion of the Study:

The major threat commonly faced by industries & humanity across the world, the bane of global warming. Most of the manufacturing industries have to reengineer their processes to reduce environment pollution & contribute towards finding a solution to the threat of global warming. Governments in most countries are coming up with the policy of 'polluters pay', thereby increasing cost to such organization. The current study deals with the carbon trading opportunities and challenges with special reference to cooperative sugar industries in western Maharashtra. The study has included only cooperative sugar industries as sample unit and examined aspects considered for carbon trading awareness, impact of awareness on carbon trading, carbon trading registration, factors affecting carbon trading for Clean Development Mechanism (CDM) project, barriers faced by organization, risk involved in projects, impact on organizations, carbon trading and carbon financing and corporate social responsibility.

It has also been studied that highest number of the sugar industries not aware of carbon trading and those who are aware they do not have complete knowledge about the carbon trading. The government and sugar industrialist should take initiation to increase the awareness and support each for carbon trading with the help of professional consultants. The industrialist willing funds from financial institution.

The Shri. Pandurang Sahakari Sakhar Karkhana (SPSSK) from Solapur generating baggase-based electricity and has earned carbon credits (certified emission reduction - CER) worth INR.4 Crore. Accordingly total 70 cooperative sugar industries having potential to additional profit around INR.280 Crore which will be contributing in the earning of foreign revenue through dealing in carbon trading.

The challenges for cooperative sugar industries to undertake Clean Development Mechanism (CDM) project included proving additionally and defining the baseline, elaborating new projects and methods, approval and monitoring procedure and carbon market volatility which can be resolved after appropriate actions by government, cooperative sugar industries with support from financial institution and professional consultancies. The participation in carbon trading by cooperative sugar industries in Western Maharashtra leads to achieve triple win formula (WIN–WIN–WIN) that mean the industrialist will gain additional profit ,the government generate foreign revenue and society benefited by reduction in carbon pollution.